Service Manual

ViewSonic VTMS2431

Model No. VS12335-2M

23.6” LCD TV

(VTMS2431_SM Rev. 1a Apr. 2009)

ViewSonic® 381 Brea Canyon Road, Walnut, California 91789 USA - (800) 888-8583

Revision History

Revision	SM Editing Date	ECR Number	Description of Changes	Editor
1a	04/21/09		Initial Release	Sophia Kao

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1. Precautions and Safety Notices

1. Appropriate Operation

(1) Turn off the product before cleaning.
(2) Use only a dry soft cloth when cleaning the LCD panel surface.
(3) Use a soft cloth soaked with mild detergent to clean the display housing.
(4) Disconnect the power plug from AC outlet if the product is not used for a long period of time.
(5) If smoke, abnormal noise, or strange odor is present, immediately switch the LCD display off.
(6) Do not touch the LCD panel surface with sharp or hard objects.
(7) Do not place heavy objects on the LCD display, video cable, or power cord.
(8) Do not use abrasive cleaners, waxes or solvents for your cleaning.
(9) Do not operate the product under the following conditions:
- Extremely hot, cold or humid environment.
- Areas susceptible to excessive dust and dirt.
- Near any appliance generating a strong magnetic field.
- Place in direct sunlight.

2. Caution

No modification of any circuit should be attempted. Service work should only be performed after you are thoroughly familiar with all of the following safety checks and servicing guidelines.

3. Safety Check

Care should be taken while servicing this LCD display. Because of the high voltage used in the inverter circuit, the voltage is exposed in such areas as the associated transformer circuits.

4. Power Supply Requirements

The external AC power operating range shall be from 90 to 264Vac

5. LCD Module Handling Precautions

5.1. Handling Precautions

(1) Since front polarizer is easily damaged, pay attention not to scratch it.
(2) Be sure to turn off power supply when inserting or disconnecting from input connector.
(3) Wipe off water drop immediately. Long contact with water may cause discoloration or spots.
(4) When the panel surface is soiled, wipe it with absorbent cotton or other soft cloth.
(5) Since the panel is made of glass, it may break or crack if dropped or bumped on hard surface.
(6) Since CMOS LSI is used in this module, take care of static electricity and insure human earth when handling.
(7) Do not open nor modify the Module Assembly.
(8) Do not press the reflector sheet at the back of the module to any directions.
(9) In case if a Module has to be put back into the packing container slot after once it was taken out from the container, do not press the center of the CCFL Reflector edge. Instead, press at the far ends of the CFL Reflector edge softly. Otherwise the TFT Module may be damaged.
(10) At the insertion or removal of the Signal Interface Connector, be sure not to rotate nor tilt the Interface Connector of the TFT Module.
(11) After installation of the TFT Module into an enclosure (LCD monitor housing, for example), do not twist nor bend the TFT Module even momentary. At designing the enclosure, it should be taken into consideration that no bending/twisting forces are applied to the TFT Module from outside. Otherwise the TFT Module may be damaged.
(12) Cold cathode fluorescent lamp in LCD contains a small amount of mercury. Please follow local ordinances or regulations for disposal.
(13) Small amount of materials having no flammability grade is used in the LCD module. The LCD module should be supplied by power complied with requirements of Limited Power Source (IEC60950 or UL1950), or be applied exemption.
(14) The LCD module is designed so that the CFL in it is supplied by Limited Current Circuit (IEC60950 or UL1950). Do not connect the CFL in Hazardous Voltage Circuit.

5.2. Handling and Placing Methods

Correct Methods:	Incorrect Methods:
Only touch the metal frame of the LCD panel or the front cover of the monitor. Do not touch the surface of the polarizer.	Surface of the LCD panel is pressed by fingers and that may cause “Mura”
	
	
Take out the monitor with cushions	Taking out the monitor by grasping the LCD panel. That may cause “Mura”
	
Place the monitor on a clean and soft foam pad.	Placing the monitor on foreign objects. That could scratch the surface of the panel or cause “Mura”
	

2. Specification

LCD panel of this product shall be provided by “CMO” with a model number of M236H1-L01.The following table defines this panel specification. Any changes in panel must be pre-approved by ViewSonic in written.

Parameter	Specification
LCD Type	a-Si TFT Active Matrix Wide Color, Transmissive Mode, Normally Black
LCD Interface	1-Channel LVDS
Resolution (Native)	1920 x 1080
Display Area	23.6” diagonal; 521.28 (H) x 293.22 (V) mm
Pixel Pitch	0.2715 (H) x 0.2715 (V) mm
Viewing Angle	H = 170, V = 160 with CR≥10 (Typical)
Contrast Ratio	1000:1 (Typical)
Brightness	300 nits (Typical)
Response Time	5 ms, (Typical), g-g
Brightness Uniformity	75% (Min), measured per panel spec.
Chromaticity(CIE1931)	White-x:0.313,White-y:0.329 (Standard Mode Only)
Colors	16.7M (8-bits)
Surface Treatment	Hard coating (3H)
Backlight	4 CCFLs (Cold cathode Fluorescent Lamp)
Preset Color	Panel Default
Gray Scale	0-255
Rated Life (Backlight)	> 50KHrs*(ILO at 3.0mA)
Front Screen Artifacts	VS Standard: a.) No Visible Streaking, Sag or Smearing artifacts when driven by the specified video cards (see 7.1 General Test Equipment) in the primary mode (VGA & 60 Hz) and after user adjustment b.) No image drift or lose fine-tune settings due to panel temperature change.
Panel Acceptance Spec	Refer to the panel acceptance criteria specification. Note: Intermittent and/or Display Pattern defects which result in further bright or dark dots will be counted individually against the above specification.

Note: Also refer to the panel defect acceptance specification.
Panel performance characteristics “ MUST BE” met in all display modes/inputs at standard test conditions.

1. **RF Tuner**

RF tuner of this product shall be provided by “Samsung DTVS205CH201A” for NTSC/ATSC. The following table defines this tuner specification.

Parameter	Specification
RF Tuning Range	NTSC/ATSC: 55.25 to 803 MHz, 2-69 Channels for Off-Air and 1-125 Channels for CATV
RF Tuner Sensitivity (S/N Ratio at un-weight)	44 dB (min.)// 48 dB (max.)
Channel Bandwidth	NTSC/ATSC/Digital Cable: 6 MHz Maximum
CVBS Characteristics: Video Amplitude Signal	0.8(min.)–1.2(max.) V
Audio Characteristics: SIF out level	500mV (typ.)
Compatible system TUNER	NTSC/ATSC/QAM
Compatible system AV	NTSC M

2. Video

Built-in A/D converter shall provide analog to digital converter for this product.

Input Parameter	Specification
CVBS Characteristics: Video Amplitude Signal DC Level Sync Pulse	0.7(min.) – 1.1(max.) V Typical. 0.3 V
S-Video Characteristics: Video Amplitude Signal	Y : 1.0Vp-p W / Neg. Sync (IN 75 Ω) C : 0.285Vp-p (IN 75 Ω)
Y, Pb, Pr Characteristics: Video Amplitude Signal	Y:1.0Vp-p (IN 75 Ω) Pb:0.7 Vp-p(IN 75 Ω),Pr:0.7 Vp-p (IN 75 Ω)
Video Bandwidth	NTSC: 6 MHz Maximum
HDMI Characteristics	Panel Link T.M.D.S HDMI-1.3
RGB Characteristics: Signal Type Sync Type Input Signal Rating Sync Level: Frequency Range Pixel Color DDC Compliance EDID Data Table	Analog VGA TTL, Separate Sync, with 2.2KΩ pull-down resistors 1250mV Max without damage to the product, 0-700 mV Full Range 2.5-5.25 V Horizontal: 30-82K Hz, Vertical: 55-75 Hz 16.7 M DDC2B Compliant, Rev 1.3 Refer to Appendix
USB Characteristics	USB 2.0

3. Audio

Audio amp of this product shall be provided by “YAMAHA” with a Model Number of YDA148 . “MST” MSD2248AL for VTMS2431-M shall be used as sound processor. In addition, a pair of speakers shall be integrated within this product. The audio signals of this product shall comply with the specification listed in the following table.

Parameter	Specification	
	Tuner Input	**Base band Input**
Power Output Max Rating	5W at 10 % T.H.D Distortion	5W at 10% T.H.D Distortion
Speaker Impedance	main speaker :8 Ω	main speaker :8 Ω
Line In	NTSC: BTSC Mono / Stereo(standard) PAL: FM Mono / Stereo(standard)	500 mV rms (Typ) 1.6 V rms (Max) Impedance: 600 ohms
Line Out earphone jack		500 mV rms 15 mW@32Ω
Flatness of Amplitude Response	+/- 3 db (at 1KHz @1W)	+/- 3 db (at 1KHz @1W)
Total Harmonic Distortion (Po=0.1 to 1 W, f=1KHz)	<2%	<2%
Signal to Noise:	12 dB (100Hz to 1KHz) 8 dB (1kHz to 10kHz)	35 dB (100Hz to 10 kHz)

4. Electrical

The following table defines the electrical specification of this product.

ELECTRICAL SPECIFICATION		
1	Power Input Voltage Range	100-240VAC +/- 10% Wide Range
2	Input Frequency Range	47-63 Hz
3	Input Current	1.0A @ 115VAC // 0.5A @ 230VAC
4	Power Supply Inrush	Max in < 80A (with fully loaded power supply) at 230Vac Shall not result in permanent failure of power supply (including blown fuse)
5	Power Consumption:	60 W (Normal), 75W (Max) // Stand by: < 2 W
6	Interference with RF and Video	There shall be no visible interference between power supply, RF and video signals. This applies to all available RF channels and video modes.
7	Electromagnetic Compatibility	This product shall adhere to the compatibility and immunity specifications in FCC.
8	Power Supply Transient Immunity (Supply Transients and Outage)	Able to withstand an ANSI / IEEE C62.41 – 1980 2000V ring wave with no damage.
9	Surge Immunity Test	Able to withstand 1.25X nominal Line Voltage for one cycle with no damage.
10	Power Supply Missing Cycle Immunity	Function properly without reset or visible screen artifact when 1/3 cycle of AC Power is randomly missing.
11	Power Supply Acoustics	The Power Supply shall not produce audible noise that would be detectable by the user (Excluding Power Supply Fan). “Audible” shall be defined in accordance with ISO 7779 (DIN EN27779:1991). Power Switch noise shall be Excluded.
12	Efficiency	>= 80% @ full load, nominal line
13	Leakage Current	<0.5mA @ 240VAC
14	Power Saving(DPMS)	N/A
15	Recovery Time	< 3 sec.
16	Power Factor Correction	Compliant with EN61000-3-2

5. Firmware & OSD

The product firmware of VS12335-2M shall have a firmware version of V2.00EB0. Any changes/revisions afterward shall also be pre-approved by ViewSonic in written. For VS12335-1M, its firmware shall have a built-in frequency table for NTSC/ATSC off-air TV/CATV, and with MTS implementation.

All audio/video and other output adjustments shall be performed by using an On Screen Display (OSD) via a Remote Control Unit (RCU) in conjunction with the front panel adjustments.The following tables list the OSD functions supported by VS12335 -2M.

OSD Table for VS12335-2M

PICTURE	Picture Mode	Standard,Dynamic,Soft,Personal
	Contrast	0~50~100
	Brightness	0~50~100
	Sharpness	0~50~100
	Tint	-50~0~+50
	Color	0~50~100
	Color Mode	Cool, Normal, Warm
	Zoom Mode	Full, Movie Scale, Zoom In,4:3
	Noise Reduction	Standard, Strong, Weak, Off

ADUIO	Sound Mode	Standard, Music, Movie, Sports, Personal
	Treble/Bass	Bass, Treble, Balance
	Prefer Language(ATSC)	English, French, Spanish
	Surround Sound	On, Off
	Audio Only	On, Off
TIME	Sleep Timer	OFF, 5,10,15,20,30,45,60,90,120,180,240 Min
	Time Zone	Pacific, Alaska, Eastern, Central, Mountain, Hawaii
	DST	On, Off
	Time-Format	12/24-hour
	Auto Sync	On, Off
	Clock	Year, Month, Day, Hour, Min, OK, Cancel
OPTION	Menu Language	English, French, Spanish
	Transparency	0%,25%,50%,75%,100%
	OSD Time Out	5,15,30,45,60 sec.
	Closed Caption	CC off, CC on, CC on mute
	Basic Selection	off, CC 1~4 Text 1~4
	Advanced Selection(ATSC)	off, Service 1~6
	Option(ATSC)	Option, Font style, Front size, Front edge style
		Front edge color, FG color, BG color, F G Opacity
		GG Opacity
	DCR	On, Off
	Restore Default	Yes, No
	TV ID	01-99
CHANNEL	TV Source	Air, CATV
	Auto Scan	Scan all channels, Digital channel only, Analog channel only

OSD Table for VS12335-2M USB

MOVIE	File list	Previous, Play/Pause,Next,Stop,Timer
PHOTO	Photo file list preview	Previous,Play/Pause,Next,Rotate, Stop,Zoom,File name
E-BOOK FILE	File list	Refer to MOVIE or PHOTO
SETUP	Language	English, French, Spanish
	Slideshow duration	3s,5s,15s,1mins,15mins,1hour
	Slideshow mode	Random, Fading, Off Bottom to top, Top to bottom Left to right, Right to left Door close, Door open Horizontal cross, Vertical cross
	Movie repeat mde	Repeat all, Repeat one
	Auto run	On, Off

6. Remote Control Unit (RCU)

An IR remote control unit shall accompany this product along with battery. In addition, this remote control unit shall have an operational distance of 5 meters and an operational angle of 15 degrees for both horizontal and vertical. Besides the key-code and protocol has fully conformed to VS standard.

Parameter	Specification
Type	IR; Made by Sighter Electronics Co., Ltd.
Range	Off axis ± 15° ≥ 5M On axis: ≥ 7M
Life Testing (Buttons)	100,000 cycle operations at a rate of 20~30 cycle / minute without load (with battery)
Color	Painting Color - PANTONE 427C (Black for front & back cover) Power Key - PANTONE 032C (RED) Key Pads – PANTONE 10C & PANTONE 7C(Cool Gray) Texts Printed on Front Cover and Key Pads - PANTONE 427C
Protocol	VS key-code & protocol.

7. Mechanical

The following table defines the mechanical specifications of this product for both chassis and cabinet.

Parameter	Specification
Dimension W/O stand	W=566.7mm, H=441.9mm and D=211.0mm W=566.7mm, H=386.7mm and D=85mm
Net Weight	7.0kg
Chassis Plastic Material	ABS (ABS HB)
External Plastic Chassis Components	Plastic Chassis, Cover, Stand, Len and Button
Internal Plastic Cabinet Components	N/A
Exterior Chassis Color	Refer to- Product ID Guide
Chassis Component's Color Difference	Refer to- Product ID Guide
Chassis Color Drift Due to UV-Light	The color drift due to UL-Light shall be less than 10 "Delta E" in the 1976 CIE L*a*b color space. Testing shall be performed according to the requirements of ASTM Test Method D4459-93.
Chassis Texture	Front Bezel:(N/A ;) Back Cover:N/A ; MT11010)
Molded Plastic	Workmanship shall be inspected according to ViewSonic Molded Plastic Parts Specification, VSCMPPSPEC001V1.2.
Screen Printed Parts, Bird Logo Recess	Artwork shall be provided and confirmed by ViewSonic.
Rear Label	A label identifying the product name, model/serial number and FCC ID/Logo shall be placed into the rear label recess located on the rear panel of the chassis.
Wall- Mount	100mmx100mm VESA high hole (n=4), M4 x 10mm, pitch =0.7mm screw mounting kit not included.
Sample	Sample of textured color chips, plastic material specification, and Material Safety Data Sheets shall be submitted to ViewSonic prior to Mass Production Release.

In addition, all exterior surfaces shall have uniform texture/color. The maximum acceptable gap between the buckets to bezel plastic pieces shall be within 1.0mm. The maximum acceptable gap between LCD panel and bezel shall be within 1.3 mm.

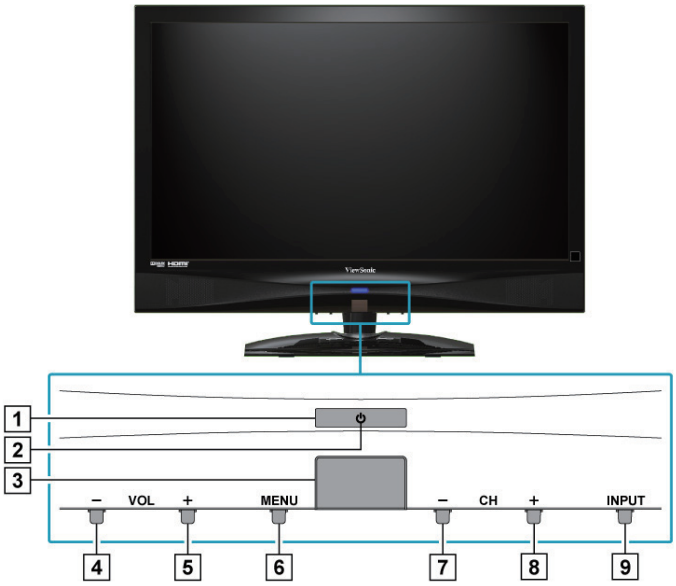
8. Environmental

The following table defines the operational/storage conditions of the product.

Operating Temperature	0°C to +40°C
Humidity	10% ~ 65% non-condensing
Altitude	0 meter to +2000 meters above sea level
Storage Temperature	-20°C to +60°C
Humidity	0 ~ 90% non-condensing
Altitude	0 meter to 12,000 meters above sea level

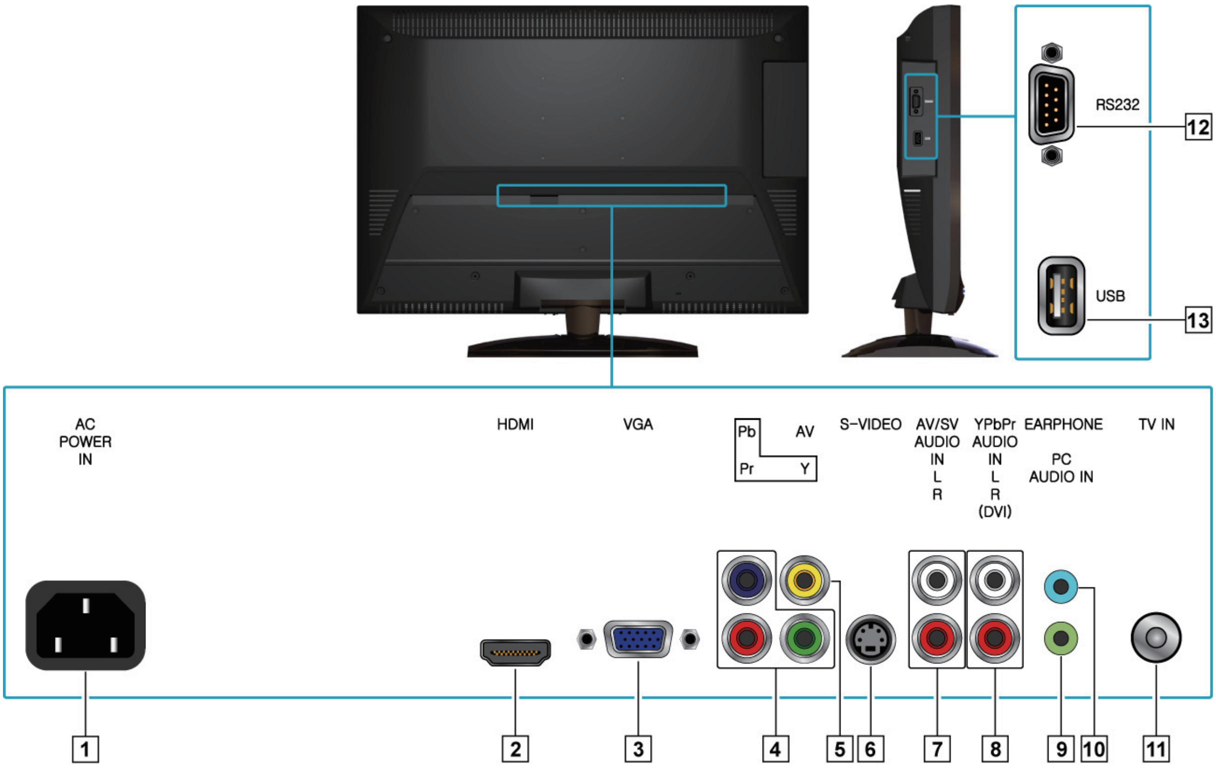
3. Front Panel Function Control Description

Front View of the Product



Item	Description
1 **Power ON/OFF button**	Turn the power on from standby mode or turn the power off to return to the standby mode.
2 **Power LED Indicator**	Lights up in blue when the TV is turned on. Lights up in orange when the TV is in standby mode.
3 **Remote Control Receiver**	Receives IR signals from the remote control.
4 **Volume Down**	Decrease sound volume or adjust a highlighted control while in OSD menu.
5 **Volume Up**	Increase sound volume or adjust a highlighted control while in OSD menu.
6 **MENU**	Turn OSD menu ON/OFF.
7 **CH Down**	Channel down when source is TV, or select a control while in OSD menu.
8 **CH Up**	Channel up when source is TV, or select a control while in OSD menu.
9 **INPUT**	Select input source.

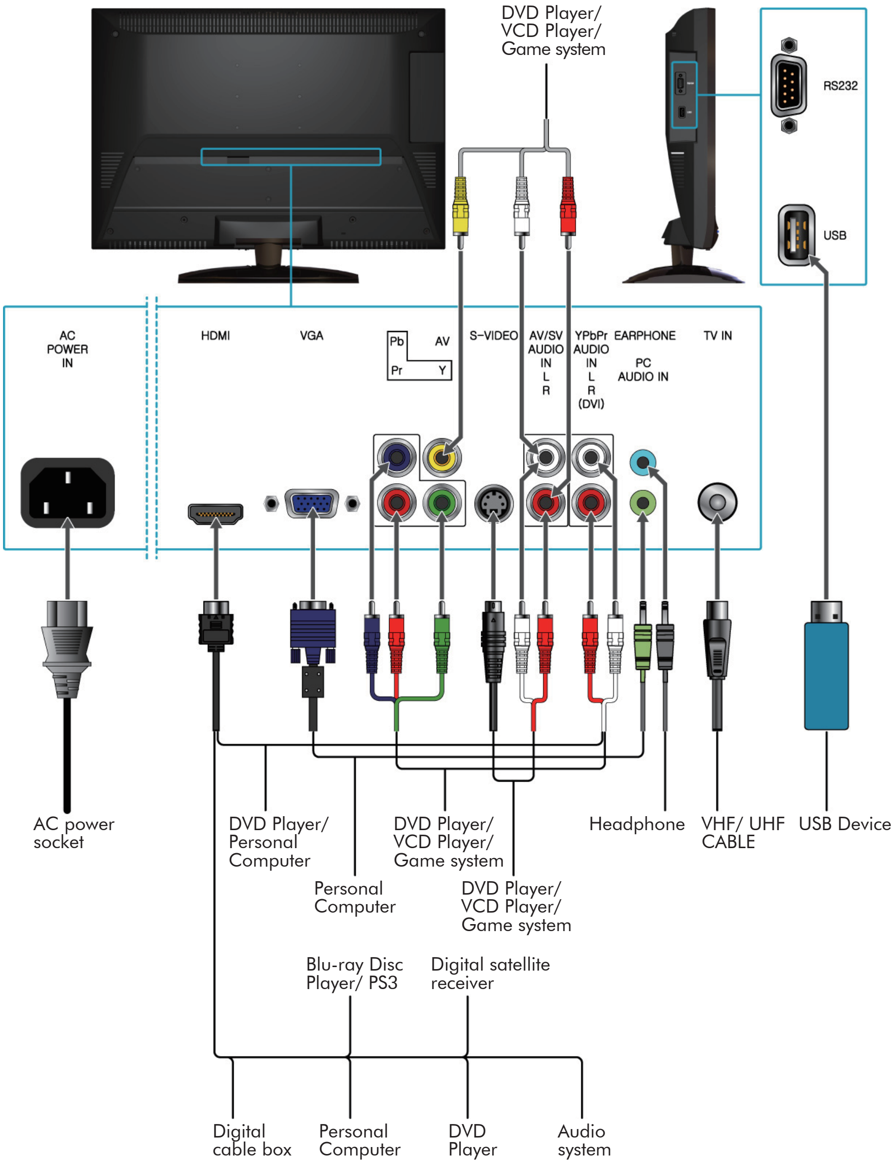
Rear View of the Product



Item		Description
1	**Power (AC input)**	Plug-in the supplied AC Power cord and connect to the AC input power source.
2	**HDMI Input Terminal**	Connect this port to the HDMI/HDMI-DVI jack of the compatible equipment.
3	**VGA signal input**	Connect a 15-pin D-sub RGB cable to the RGB output of your computer and the other end to the RGB input on the rear of the LCD TV.
4	**YPbPr signal input**	Connect this jack to the YPbPr output of A/V device.
5	**Composite Video input**	Connect this jack to the composite video output connectors on your A/V equipment.
6	**S-Video input**	Connect the S-Video cable from the compatible device to this connector on the rear panel of the LCD TV.
7	**AV/ S-Video Audio input (left/ right)**	Connect the Audio in cable for AV/ S-Video from this jack to the corresponding connectors on your A/V device.
8	**YPbPr/ DVI Audio input (left/ right)**	Connect the Audio in cable for YPbPr/ HDMI-DVI from this jack to the corresponding connectors on your A/V device.
9	**PC Audio input**	Connect the RGB Audio Out on your computer to the RGB Audio on the rear of the LCD TV.

Item		Description
10	Headphone Jack	Connect to your headphones. By connecting the headphones, you can listen to the sound from the TV on headphones. ※If you connect the headphones, the TV speakers will be muted.
11	TV Input Jack	Connect this jack to your Cable or VHF/UHF antenna.
12	RS232 signal input	This port is for the service technician's use. For the function description of RS232, please download the complete user guide from www.viewsonic.com and refer to RS232 Protocol on page 45 to 55. (The RS232 application software is not supplied with TV.)
13	USB	Connect to your USB devices, such as USB flash drive/ portable hard drive.

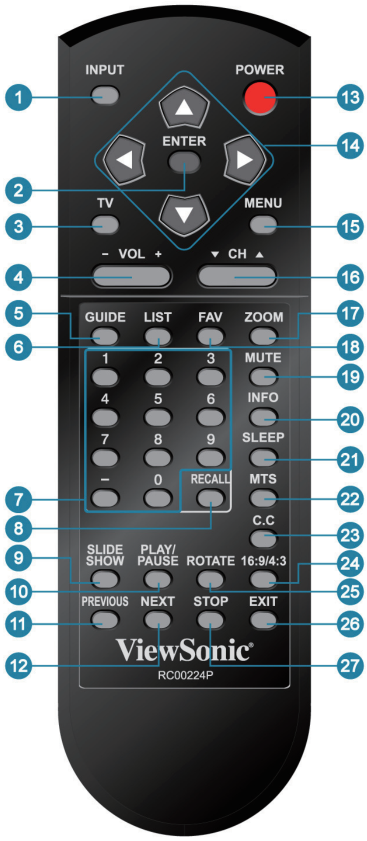
Connecting the LCD TV



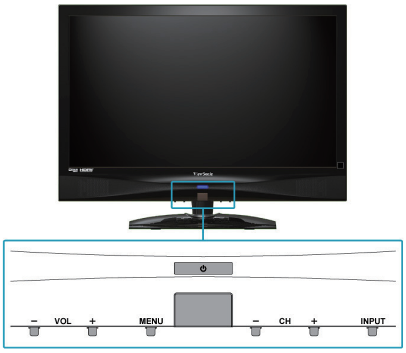
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- Please refer to the Quick Start Guide (supplied) when connecting the other equipment to your LCD TV.
- For detailed information, please download the complete user guide from www.viewsonic.com and refer to page 16 to 20.

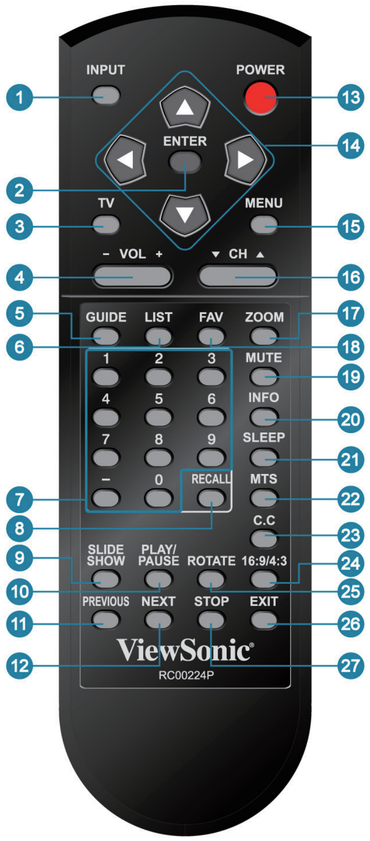
Remote Control



Buttons located at the bottom of the LCD TV will operate the same as these buttons on the remote control.



Button		Description
1	**INPUT**	Input source select
2	**ENTER**	Confirm selection or enter selected menu
3	**TV**	Direct to TV source
4	**- VOL +**	Adjust volume UP/DOWN
5	**GUIDE**	Show electronic program guide (EPG)
6	**LIST**	Select channel from program list
7	**0~9, - number buttons**	Directly channel select



Button		Description
8	**RECALL**	Return to previous channel
9	**SLIDE SHOW**	Display the photo files in slideshow mode
10	**PLAY/ PAUSE**	Pause or play in photo/movie mode
11	**PREVIOUS**	Display previous photo
12	**NEXT**	Display next photo
13	**POWER**	Power ON/OFF
14	**▲▼◀▶ buttons**	Move the cursor in OSD menu: UP/ DOWN for OSD function select and LEFT/ RIGHT for function adjust
15	**MENU**	On Screen Display (OSD) menu ON/OFF
16	**▼ CH ▲**	Adjust Channel UP/DOWN
17	**ZOOM**	Adjust window size
18	**FAV**	Select from preset Favorite Channels
19	**MUTE**	Volume mute ON/OFF
20	**INFO**	Display current information
21	**SLEEP**	Set timer to turn off TV
22	**MTS**	Select Mono, Stereo or SAP sound
23	**C.C**	Select caption mode
24	**16:9/4:3**	Switch between 16:9 and 4:3 aspect ratio screen
25	**ROTATE**	Rotate the photos in 90°, 180°, 270°, and 0°
26	**EXIT**	Exit the current screen
27	**STOP**	Return to photo thumbnail screen or stop the movie playing and go back to the Movie Preview screen

※ Button 9~12, 24~27 only works under Movie mode of the USB input source.

Operation

Storing Channels into Memory

1. Press the **MENU** button to display the OSD main menu.
2. Press ◄ or ► to select the "CHANNEL" menu.
   Press ▲ or ▼ to select "TV Source", and use ◄ or ► to select the antenna connection to "Air" or "Cable".
   Air: RF signal programs by "Air".
   Cable: RF signal programs by "Cable".
3. Press ▲ or ▼ to select "Auto Scan", then press ► to enter.
4. Press ▲ or ▼ to select "Scan all channels", "Digital channel only", or "Analog channel only" and press ► to perform Auto Scan function.
   To stop scanning, press **MENU** at any time.
5. The Auto Scan screen will be shown, and after it is done, the screen will return to the first found channel.

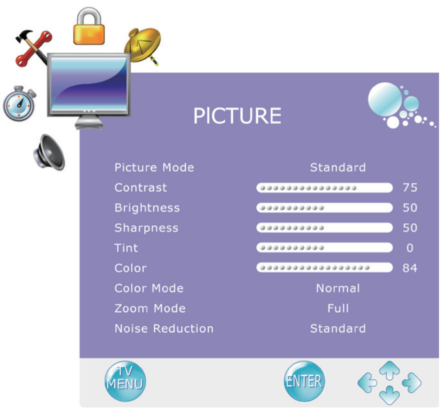






Viewing the Menus

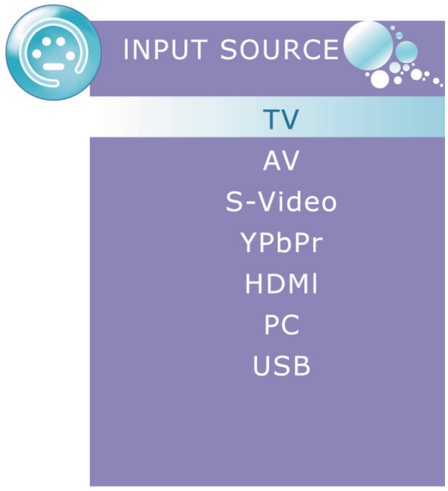
1. Press the **MENU** button to display the OSD main menu. There are six top menus on the screen: PICTURE, AUDIO, TIME, OPTION, LOCK, and CHANNEL.
2. Press ◄ or ► to select your desired top menu.
3. Press **ENTER** or ▼ to enter the menu you select.
4. Use ▲▼ to select the control you want to adjust.
5. When selecting the control with ►, press ► to enter next level menu or enable the function. (► will only appear when the control is highlighted)
6. Press ◄► to adjust or select the settings.
7. Press **MENU** to exit from the OSD menu.



Selecting the Input Source

To select the TV or other external input sources connected to the TV.

1. Press the **INPUT** button on the remote control.
2. Press ▲ or ▼ to select the required input source between TV, AV, S-Video, YPbPr, HDMI, PC, or USB.
3. To confirm the selection, press **ENTER**.



Favorite Channel Setting

To set your favorite channel into memory:

1. Press the **MENU** button to display the OSD main menu.
2. Press ◄ or ► to select the “CHANNEL” menu.
   Press ▲ or ▼ to select “Favorite”, then press ► button to enter “Favorite” setting.
3. Press ▲ or ▼ to select the channel you’d like to be your favorite channel.
   Press **ENTER** to confirm your selection.
4. To cancel the selection, Press **ENTER** again on the selected channel.
5. Press **MENU** to exit.

＊To view your favorite channels, press **FAV** button to show Favorite List and select your favorite channels that have already been stored.





Adding/Erasing Channel

When the channel is erased, it will not appear on the screen when you browse the channels with ▼CH▲ button. To see the channel again, you must add the channel or perform the “Auto Scan” (page 9) function again.

1. Press the **MENU** button to display the OSD main menu.
2. Press ◄ or ► to select the “CHANNEL” menu.
   Press ▲ or ▼ to select “Show/Hide”, then press ► button to enter “Show/Hide” setting.
3. Press ▲ or ▼ to select the channel you want to Show/ Hide, and check or uncheck it with **ENTER** button.
4. Press **MENU** to exit.

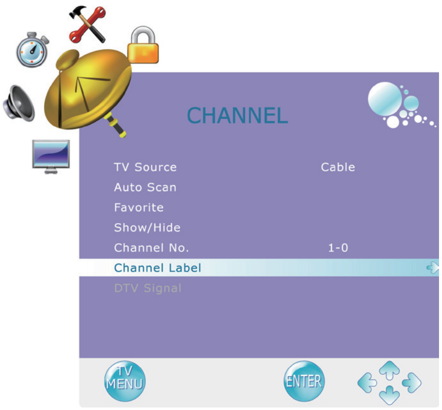


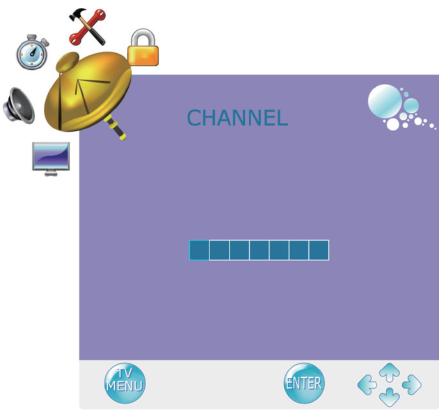


Channel Name Setting

To edit a name for the current channel:

1. Press the **MENU** button to display the OSD main menu.
2. Press ◄ or ► to select the “CHANNEL” menu.
3. Press ▲ or ▼ to select “Channel No.”, then press ◄ or ► to select the channel you want to edit the name.
4. Press ▲ or ▼ to select “Channel Label”, then press ► button to enter “Channel Label” setting.
5. Use ▲ or ▼ to choose letters or signs, ◄ or ► to move forward or backward.
6. After you input the channel name, press **MENU** or **ENTER** to complete the setting.
7. Press **MENU** to exit.

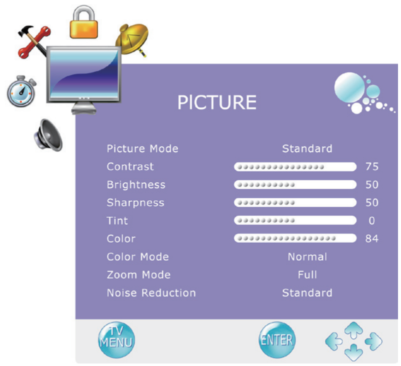




Adjusting the Settings

1.

(1) Press the **MENU** button to display the OSD main menu.
(2) Press ◄ or ► to select your desired top Menu.
(3) Press ▲ or ▼ to select the control of “Contrast”, “Brightness”, “Sharpness”, “Tint”, “Color”, then press ◄ or ► to adjust the level.
(4) Press **MENU** to exit.

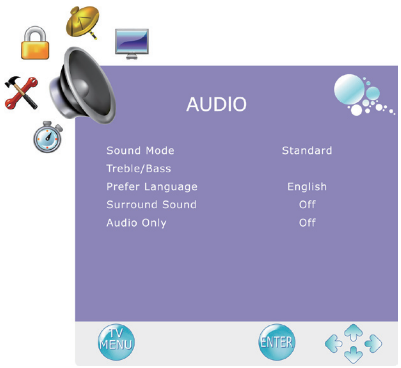


2.

(1) Press the **MENU** button to display the OSD main menu.
(2) Press ◄ or ► to select your desired top Menu.
(3) Press ▲ or ▼ to select the control of “Picture Mode”, “Color Mode”, “Zoom Mode”, “Noise Reduction”, “Sound Mode”, “MTS”, “Prefer Language” (in DTV mode), “Surround Sound”, “Audio Only”, “Sleep Timer”, “Time Zone”, “DST”, “Time Format”, “Auto Sync”, “Clock”, “Menu Language”, “Transparency”, “OSD Time Out”, “DCR” (Dynamic Contrast Ratio), and “TV ID”, then press ◄ or ► to select your desired option.
(4) Press **MENU** to exit.

＊When in YPbPr source, the option selected in Picture Mode of PICTURE Menu (Standard, Dynamic, Soft, or Personal) will be applied in USB source.





3.

(1) Press the **MENU** button to display the OSD main menu.
(2) Press ◄ or ► to select your desired top Menu.
(3) Press ▲ or ▼ to select the control with ►, including “Treble/Bass”, “Closed Caption”, “Restore Default”, then press ► to perform the function or enter detailed settings.





Setting up Time menu

1. Press the **MENU** button to display the OSD main menu.
2. Press ◄ or ► to select the “TIME” menu.
3. Press ▲ or ▼ to select “Sleep Timer”, and press ◄ or ► to set the “Sleep Timer” from 5~240 min, or Off.
4. Press ▲ or ▼ to select “Time Zone”, and select the correct time zone of your area with ◄ or ►. The displayed time of “Clock” will be changed at the same time automatically. To adjust “Clock”, select “Clock” and press ►. Use ◄ or ► to change between year/ month/ date/ hour/ minute, ▲ or ▼ to adjust. When you finish adjustment, select “OK” and press ENTER to complete the setting.
   ＊The “Clock” time can only be adjusted manually when “Auto Sync” is set to “Off”.
5. Press ▲ or ▼ to select “DST” (Daylight Saving Time), and select On or Off with ◄ or ► according to the time zone of your area. The “Clock” time will change automatically.
6. Press ▲ or ▼ to select “Time Format”, and ◄ or ► to select 12-hour or 24-hour.
7. Press **MENU** to exit.

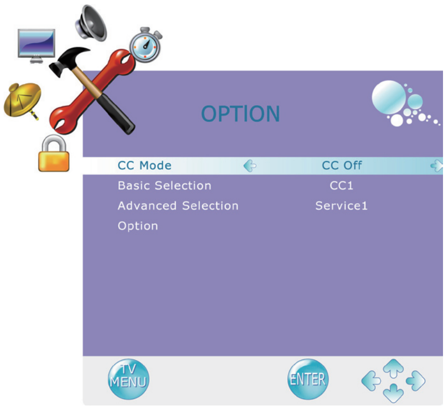




Closed Caption Setting

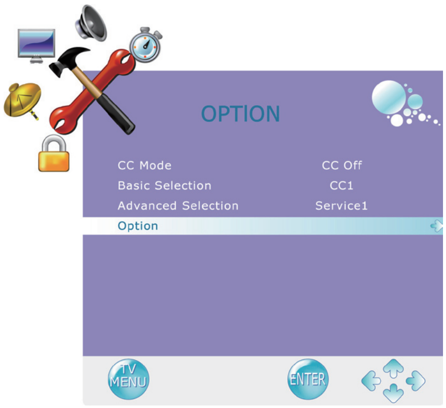
1. Press the **MENU** button to display the OSD main menu.
2. Press ◄ or ► to select the “OPTION” menu.
   Press ▲ or ▼ to select “Closed Caption”, then press ► button to enter “Closed Caption” setting.
3. Press ▲ or ▼ to select CC Mode, Basic Selection, or Advanced Selection, and use ◄ or ► to make your choice.
   Basic Selection: To set basic analog closed caption options. (CC1~CC4, TEXT1~TEXT4, Off)
   Advanced Selection: To select closed caption signal formats and set up caption modes for digital TV channels. (Service1~6, Off)





For detailed Close Caption setting:

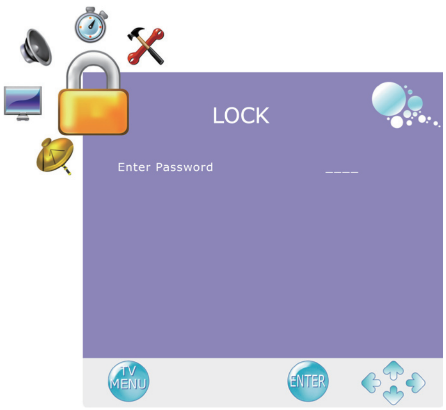
1. Press ▲ or ▼ to select "Option", then press ► to enter "Option" setting.
2. Press ◄ or ► to select the Mode to be "Custom", and then use ▲ or ▼ to select desired options and use ◄ or ► to adjust detailed settings.
   ＊When you select the Mode to be "Default", you can not adjust the detailed settings.





Using the Parent Controls

1. Press the **MENU** button to display the OSD main menu.
2. Press ◄ or ► to select the "LOCK" menu.
3. Press **ENTER** or ▼ to enter Password.
4. Enter the password. (The default password is 0000)
5. Move to "System Lock", and select "On" to enable the detailed settings.
6. Move to "US" or "Canada" rating system.

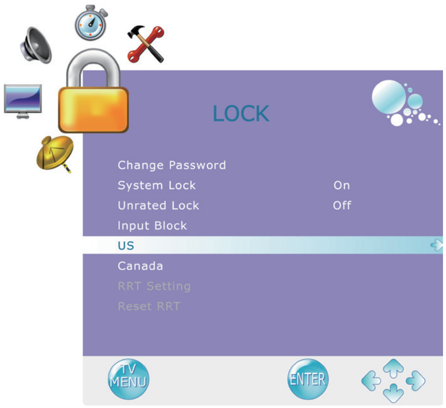




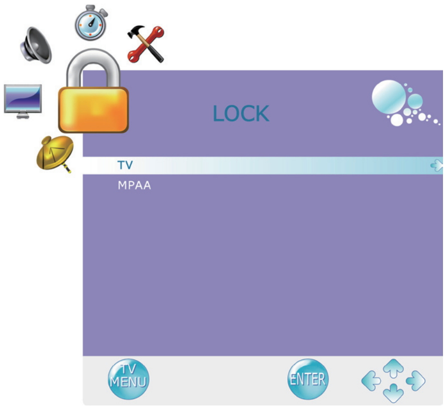
US: Press ► to set TV or MPAA ratings.

(1) TV

1. Press ▲ or ▼ to select “TV”, then press ► to enter “TV” rating system setting.

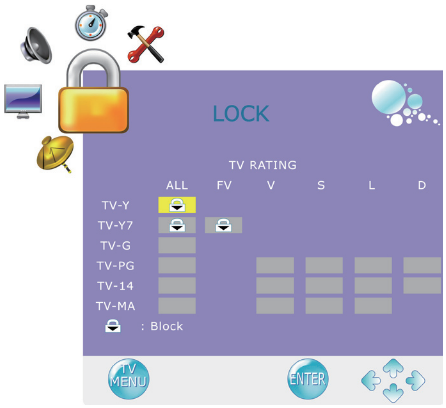


   The following screen will allow you to customize the following TV ratings:
   Y (all children)
   Y7 (older children)
   G (general audience)
   PG (guidance suggested)
   14 (strongly cautioned)
   MA (mature audience)



   You can also customize the TV ratings for the following content:
   ALL (All types content)
   FV (fantasy violence)
   V (violence)
   S (sexual situations)
   L (adult language)
   D (sexsual dialog)

2. Press **ENTER** to set or reset each area.
3. Press **MENU** to exit.

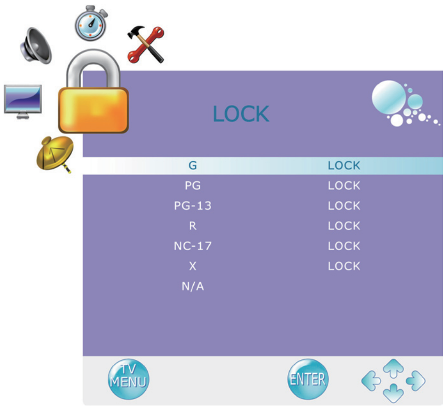


(2) MPAA

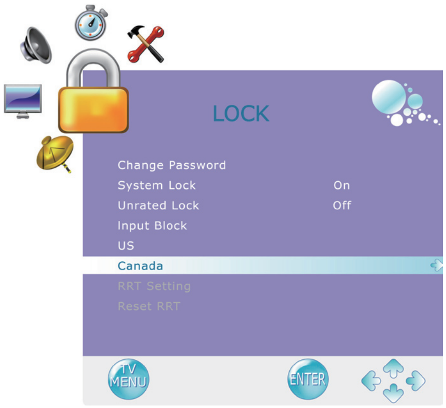
1. Press ▲ or ▼ to select “MPAA”.
2. Press ▲ or ▼ to select your desired MPAA ratings level.

   The MPAA ratings level are defined as following:
   G (general audience)
   PG (parental guidance suggested)
   PG-13 (recommended for children 14 years of age or older)
   R (mature audience)
   NC-17 (no one under 17 years of age)
   X (adult audience only)
   N/A (not applicable)

3. Press **MENU** to exit.



Canada: Press ► to set Canadian English and French ratings.



(1) Canadian English

1. Press ▲ or ▼ to select "Canada Eng".
2. Press ► to enter.
3. Press ▲ or ▼ to select your desired Canadian English rating level.

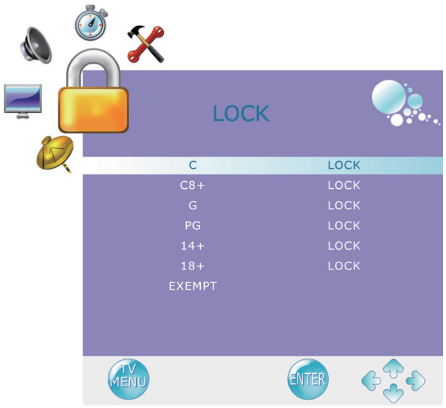
   The Canadian English rating levels are defined as following:
   C (children)
   C8+ (children eight years and older)
   G (general programming, suitable for all audiences)
   PG (parental guidance)
   14+ (viewers and older)
   18+ (adult programming)
   EXEMPT (exempt)

4. Press **MENU** to exit.



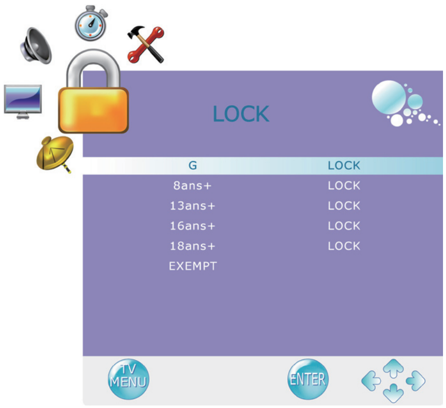
(2) Canadian French

1. Press ▲ or ▼ to select "Canada Fre".
2. Press ► to enter.
3. Press ▲ or ▼ to select your desired Canadian French rating level.



   The Canadian French rating levels are defined as following:
   G (genenral)
   8ans+ (children eight years and older)
   13ans+ (not appropriate for children of less than 13 years)
   16ans+ (not appropriate for children of less than 16 years)
   18ans+ (reserved to adults)
   EXEMPT (exempt)

4. Press **MENU** to exit.

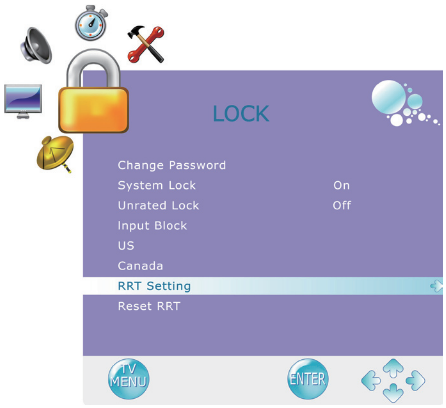


To Block Unrated Movie or TV Programs



1. Press ▲ or ▼ to select "Unrated Lock", then press ◄ or ► to select "On" or "Off". When "On" is selected, all programs that are not rated will be blocked.
2. Press **MENU** to exit.

To Set Rating Region Table



RRT Setting defines the rating standard for a particular geographic region and/ or country.

1. Press ▲ or ▼ to select "RRT Setting", then press ► to enter RRT setting.
2. Select each adjustable setting with ▲ or ▼, then press ◄ or ► to select the sub-selection.
3. Press **MENU** to exit.

＊The picture here only shows an example of the content of RRT Setting. However, the selections and sub-selections of RRT Setting may be different in your OSD menu according to the local broadcasting system.

＊To reset RRT setting, move to "Reset RRT", and press ► to reset.

To Change Password



1. Press ▲ or ▼ to select "Change Password", then press ► to enter "Change Password" setting.
2. Move to "Enter Old Password", then enter the old password with number keys.
3. Enter your new password on "Enter New Password".
4. Enter your new password again on "Confirm Password".

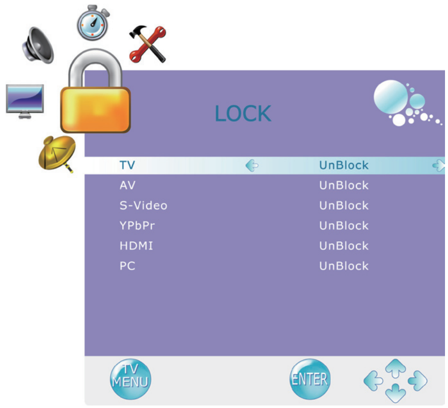
After you complete the last step, the screen will return to the top page of LOCK menu. If so, the password has been changed successfully.



To block by Input Source

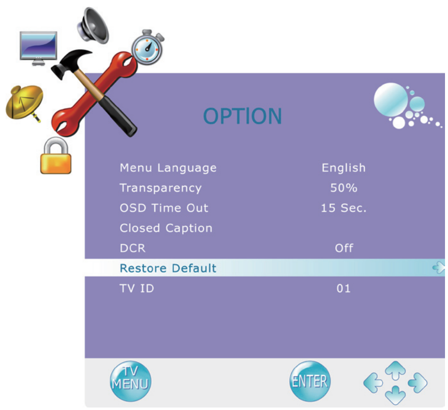
1. Press ▲ or ▼ to select “Input Block”.
2. Press ▲ or ▼ to select the input source, then press ◄ or ► to select from “Block” or “UnBlock”.
3. Press **MENU** to exit.





To Restore Factory Setting

1. Press the **MENU** button to display the OSD main menu.
2. Press ▲ or ▼ to select the “OPTION” menu.
3. Press **ENTER** or ► to enter “OPTION” menu.
4. Press ▲ or ▼ to select “Restore Default”, then press ► to restore the factory default setting.
5. Select “Yes” and press **ENTER** to confirm the setting.



Setting RS232 Parameter

1. Press the **MENU** button to display the OSD main menu.
2. Press ▲ or ▼ to select the “OPTION” menu.
3. Press **ENTER** or ► to enter “OPTION” menu.
4. Press ▲ or ▼ to select “TV ID”, then press ◄ or ► to set the TV ID number from 01~99. For detailed information, please download the complete user guide from www.viewsonic.com and refer to RS232 Protocol on page 45~55.

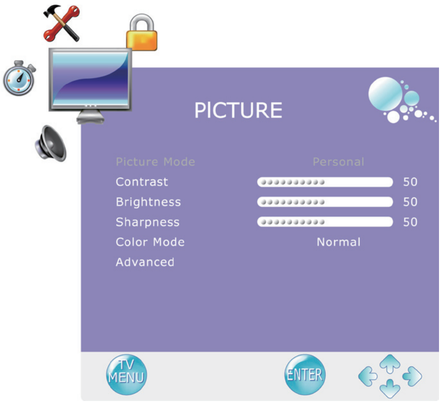


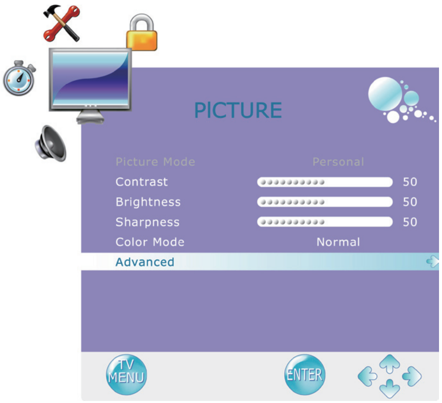
Using PC Function

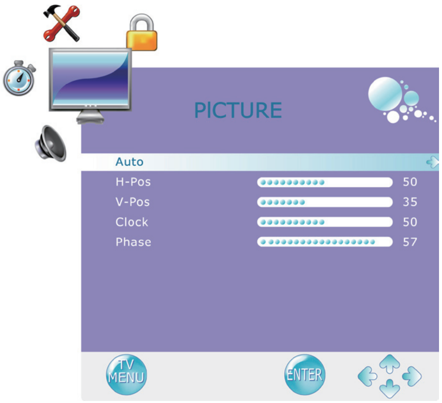
1. When in PC source, press the **MENU** button to display the OSD main menu.
2. Press ◄ or ► to select the “PICTURE” menu.
3. Press ▲ or ▼ to select your desired controls, and press ◄ or ► to adjust.
4. For advanced PC functions, select “Advanced” (only in PC source) and press ► to enter.
5. Press ▲ or ▼ to select “Auto” (Auto adjustment), “H-Pos” (H-Position), “V-Pos” (V-Position), “Clock” or “Phase”, and adjust the level with ◄ or ►.

∗ When in PC source, the other menus are the same as or similar to when in other source.

∗ When there is no signal in the PC mode, “No Signal” will be displayed on the screen and the TV will automatically turn into power-saving mode after a few seconds’ idleness. Press **INPUT** or **POWER** button on the remote control and the TV will return to VGA mode.







Using USB Function

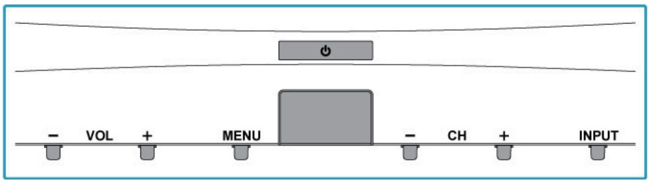
1. After a USB device is inserted into the USB jack, the screen will automatically jump to the USB mode selection screen.



2. The default modes are: MOVIE, PHOTO, E-BOOK, FILE, and SETUP. Press ◀ or ▶ keys on the remote control to switch between different modes, and press **ENTER** to enter the selected mode.
3. Use ▲ or ▼ to move the cursor up and down, ◀ to return to previous level, ▶ to enter next level. Press **EXIT** or **MENU** will return to the top level menu screen.
4. When the file you wish to play is selected, press **ENTER** to play.

※You can also use the buttons on the TV panel to make selection. The panel buttons function the same as the following keys on the remote control:

VOL - : ◀
VOL + : ◀
MENU : MENU/EXIT
CH - : ▼
CH + : ▲
INPUT : ENTER



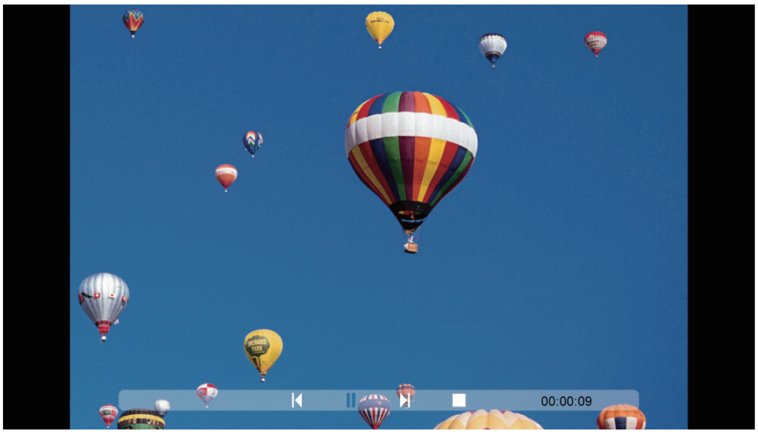
∗Press the **CH -** and **INPUT** keys together at the same time will change the input source from USB mode to TV mode.

MOVIE mode: Select the Movie icon to get to the Movie Preview screen. All the movie files will be listed in the playlist at the left of the screen. The right side of the screen will start playing the selected movie. Use arrow keys to navigate between the movie files, and you can preview the movie in the window on the right side of the screen.



∗When playing the movie in the preview screen, audio will be muted.

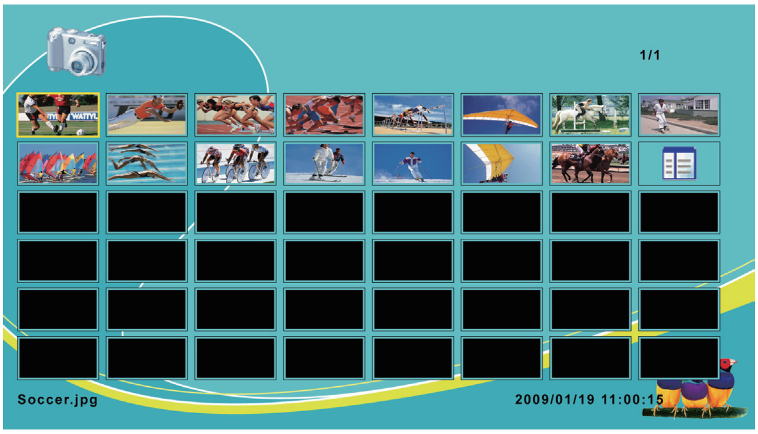
Press **ENTER** to play the movie. Press **ENTER** again and the info bar at the bottom of the screen will be displayed.



The info bar includes some quick launch buttons:

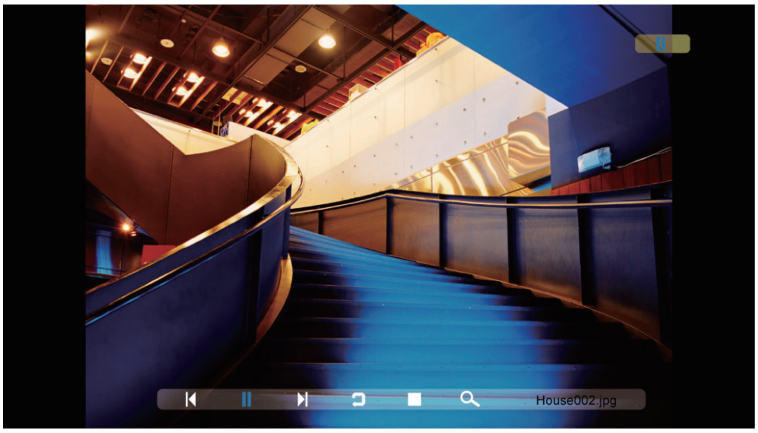
Item	Function	Description
I◀	**Preivous**	Play the previous movie in the playlist.
▶/II	**Play/Pause**	Stop the movie from playing. Press again to play.
▶I	**Next**	Play the next movie in the playlist.
■	**Stop/Back**	Stop the movie playing and go back to the Movie Preview screen.

PHOTO mode: Photo thumbnails will be displayed in this folder. Use arrow keys to select a photo.



∗ The photo will not be displayed if it is not supported by this TV. Instead, the photo thumbnail will be replaced by the “  ” icon.

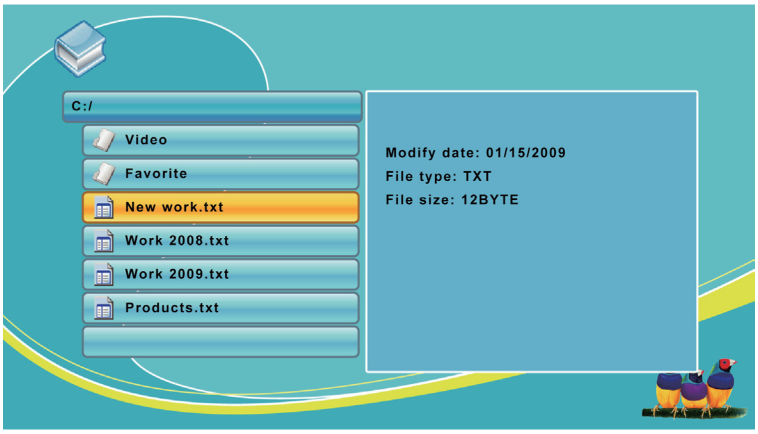
Press **ENTER** to display it (pause mode). Press **ENTER** again to display the info bar at the bottom of the screen.



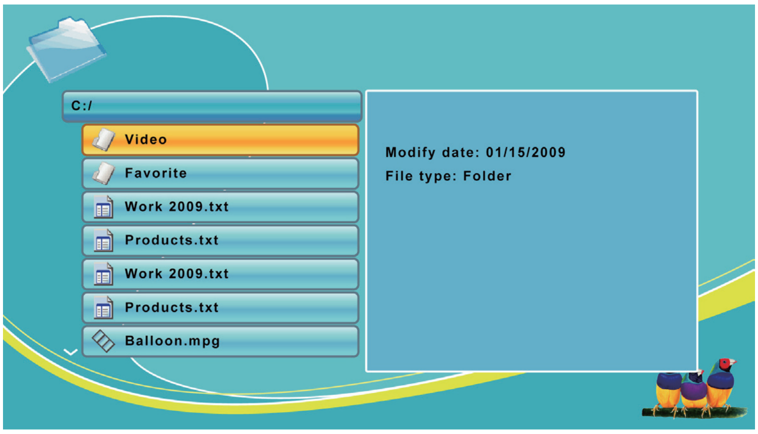
The info bar includes some quick launch buttons:

Item	Function	Description
I◄	**Preivous**	Display previous photo.
►/II	**Play/Pause**	Change to slideshow mode. Press again to keep in pause mode.
►I	**Next**	Display next photo.
↻	**Rotate**	Rotate the current photo. 90° → 180° → 270° → 0° (normal).
■	**Stop/Back**	Return to photo thumbnail screen.
🔍	**Zoom**	Zoom in the current photo. Rate is x2 → x4 → x8 → x16 → x1 (normal).

E-BOOK mode: Select the .txt file in the E-BOOK you'd like to read, and press **ENTER** to display it. To display next page of the .txt file, press ▼.

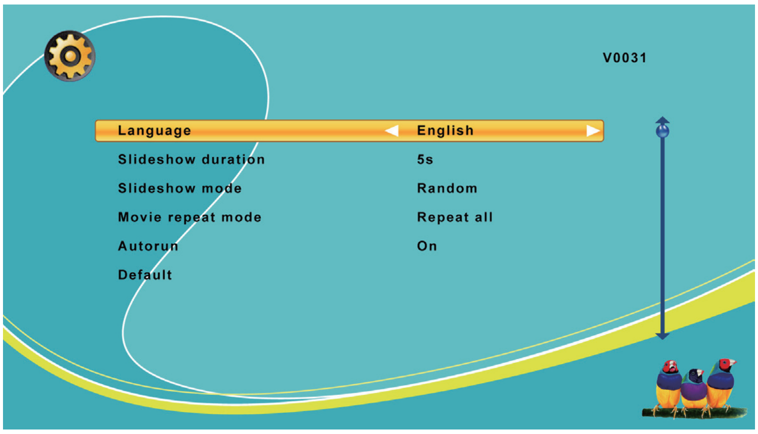


FILE mode: The file mode is designed for you to examine the content of the storage device, performance file manipulation and firmware upgrade.
Press **ENTER** on the folder to enter into the subfolder. Press **ENTER** on the file to start playback of the file.



∗All files of MOVIE, PHOTO, and E-BOOK can be found in FILE mode.

SETUP mode: The screen is designed for basic configuration of the system. In SETUP menu screen, press ▲ or ▼ to select the items, and press ◄ or ► to switch the options for selected item. Press **ENTER** to confirm the change. In Setup menu, you can select Language, Slideshow duration, Slideshow mode, and Movie repeat mode. If you select Autorun to "On", and turn off and on the power again, then the TV will display the photo in slideshow mode automatically. To stop and return to USB mode selection screen, press **MENU** key at anytime. To return to factory default settings, select "Default" and press **ENTER**.



∗To adjust the setting of Contrast, Brightness, Sharpness, Tint, or Color in USB source, switch to YPbPr source and adjust in PICTURE Menu.

Notes:Initial password:0000
If you forget your initial password,you can press"3660"to resume.

4. Circuit Description

- **A/D converter**

This brick convert is the 110-220AC input voltage to 24V output for inverter use and 5V for panel , system and audio use and 3.3V,1.8V for controller use.

- **INVERTER**

In order to drive the CCFLs embedded in the panel module, there is a half bridge inverter to convert by the controller.
The input 24V up to hundreds of AC voltage output.
The inverter is formed by symmetric in order to drive the separate lamp modules.
The input stage consists of a PWM controller, half bridge inverter, and switching MOSFET to convert DC input into AC output.
The output stage consists of a tuning capacitor, coupling capacitor, transformer, push-pull MOSFET pair to boost AC output up to hundreds of voltage.
And one resister is serial to lamp for output voltage feedback.
There are two signal to control the inverter which come from system.
Logic "high" level which send to I901 is turn on the inverter.
BRI signal control brightness by DC level which was integral from PWM signal.

- **I206 Scaler MSD2248AL**

The MSD2248AL is a highly integrated controller IC for LCD/PDP DTV applications with resolutions up to full-HD(1920 x 1080). It is configured with an integrated triple-ADC/PLL, a multi-standard TV video and audio decoder, a motion adaptive video de-interlacer, a scaling engine, the MStarACE-3 color engine, an advanced 2D graphics engine, a transport processor, a high-definition (HD) MPEG video decoder, a 24-bit DSP for MPEG audio decoding, a DVI/HDCP/HDMI receiver, and a peripheral control unit providing a variety of HDTV control
functions.
The MSD2248AL comprises an MPEG-2 transport processor with advanced section filtering capability, an MPEG-2 (MP@HL profile) video decoder, a DolbyDigital (AC-3)/MPEG layer I and II digital audio decoder with analog audio outputs that are designed to support ATSC HD/SDTV programs while handling ATSC CC and EPG.
With additional software support, the MSD2248AL can be used in DVB-T standard areas such as part of Asia,Africa, and Australia. Furthermore, it is also possible to decode MPEG-4, JPEG, MP3 formats from external sources such as USB interfaces.
For analog TV, the MSD2248AL includes NTSC/PAL/SECAM multi-standard video decoder comprising a 3-D motion adaptive comb filter and time-based correction, and a BTSC/A2/EIA-J audio decoder to support worldwide television standards. In addition, the MStar advanced LCD TV processor enhances video quality,motion adaptive de-interlacer, picture quality adjustment units, and MStarACE-3 color engine.
By integrating peripherals including USB 2.0 host controller, UART, IR, SPI, I2C, and PWM, the MSD2248AL fulfills all requirements in advanced DTV sets.To further reduce system costs, the MSD2248AL also integrates intelligent power management control capability for green-mode requirements and spread-spectrum support for EMI management.

PIN DESCRIPTION
Analog Interface
Pin Name Pin Type Function Pin
VCLAMP CVBS/YC Mode Clamp Voltage Bypass 18
REFP Internal ADC Top De-coupling Pin 19
REFM Internal ADC Bottom De-coupling Pin 20
REXT Analog Input External Resister 390 ohm to AVDD_33 13
BIN1P Analog Input Analog Blue Input from Channel 1 21
SOGIN1 Analog Input Sync-On-Green input from Channel 1 22
GIN1P Analog Input Analog Green Input from Channel 1 23
RIN1P Analog Input Analog Red Input from Channel 1 24
BINM Analog Input Reference Ground for Analog Blue Input 25
BIN0P Analog Input Analog Blue Input from Channel 0 26
GINM Analog Input Reference Ground for Analog Green Input 27

GIN0P Analog Input Analog Green Input from Channel 0 28
SOGIN0 Analog Input Sync-On-Green Input from Channel 0 29
RINM Analog Input Reference Ground for Analog Red Input 30
RIN0P Analog Input Analog Red Input from Channel 0 31
HSYNC1 Schmitt Trigger Input
w/ 5V-tolerant
HSYNC / Composite Sync for VGA Input from channel 1 16
VSYNC1 Schmitt Trigger Input
w/ 5V-tolerant
VSYNC for VGA Input from channel 1 17
HSYNC0 Schmitt Trigger Input
w/ 5V-tolerant
HSYNC / Composite Sync for VGA Input from channel 0 34
VSYNC0 Schmitt Trigger Input
w/ 5V-tolerant
VSYNC for VGA Input from channel 0 35
Analog Video Input/Output Interface
Pin Name Pin Type Function Pin
VCOM1 Analog Input CVBS Video Input Reference Ground 43
VCOM0 Analog Input CVBS Video Input Reference Ground 45
CVBS7 Analog Input CVBS (Composite) Video Input Channel 7 36
CVBS5 Analog Input CVBS (Composite) Video Input Channel 5 37
CVBS6 Analog Input CVBS (Composite) Video Input Channel 6 38
CVBS4 Analog Input CVBS (Composite) Video Input Channel 4 39
CVBS3 Analog Input CVBS (Composite) Video Input Channel 3 40
CVBS2 Analog Input CVBS (Composite) Video Input Channel 2 41
CVBS1 Analog Input CVBS (Composite) Video Input Channel 1 42
CVBS0 Analog Input CVBS (Composite) Video Input Channel 0 44
CVBSOUT Analog Output CVBS (Composite) Video Output 48
Analog Audio Input/Output Interface
Pin Name Pin Type Function Pin
SIF1P Analog Input SIF Audio Input Channel 1 51
SIF1M Analog Input Reference Ground for SIF Audio Input Channel 1 52
I2S_OUT_MCK Output Audio Master Clock Output 109
I2S_OUT_BCK Output Audio Bit Clock Output 110
I2S_OUT_WS Output Word Select Output; 4mA driving strength 108
I2S_OUT_SD Output Audio Serial Data Output; 4mA driving strength 111
I2S_OUT_MUTE Output Audio Output Mute Control 112
SPDIFO Output S/PDIF Audio Output; 4mA driving strength 107
I2S_IN_SD Input Audio Serial Data Input 105
SPDIFI Input S/PDIF Audio Input 106
AUVRM Analog Output Negative Reference Voltage for Audio ADC 67
AUVRP Analog Output Positive Reference Voltage for Audio ADC 68
AUVAG Analog Output Reference Voltage for Audio Common Mode 69
AUL0 Analog Input Audio Line Input Left Channel 0 55
AUR0 Analog Input Audio Line Input Right Channel 0 56
AUL1 Analog Input Audio Line Input Left Channel 1 57
AUR1 Analog Input Audio Line Input Right Channel 1 58
AUL2 Analog Input Audio Line Input Left Channel 2 59
AUR2 Analog Input Audio Line Input Right Channel 2 60
AUL3 Analog Input Audio Line Input Left Channel 3 61
AUR3 Analog Input Audio Line Input Right Channel 3 62
AUOUTL2 Analog Output Main Audio Output Left Channel 2 71
AUOUTR2 Analog Output Main Audio Output Right Channel 2 72
AUOUTL1 Analog Output Main Audio Output Left Channel 1 73
AUOUTR1 Analog Output Main Audio Output Right Channel 1 74
AUOUTL0 Analog Output Main Audio Output Left Channel 0 76
AUOUTR0 Analog Output Main Audio Output Right Channel 0 77
AUCOM Analog Input Reference Ground for Audio Line Input 63
TS Input Interface

Pin Name Pin Type Function Pin
TSCLK Input w/ 5V-tolerant TS Clock 100
TSDATA[7:0] Input w/ 5V-tolerant TS Data in Parallel; LSB (bit 0) is for serial TS data 97-90
TSVALID Input w/ 5V-tolerant TS Data Valid 98
TSSYNC Input w/ 5V-tolerant TS Sync-Byte Indicator 99
DVI/HDMI Interface
Pin Name Pin Type Function Pin
RX0N Input DVI/HDMI Channel 0 Negative Data Input 4
RX0P Input DVI/HDMI Channel 0 Positive Data Input 5
RX1N Input DVI/HDMI Channel 1 Negative Data Input 7
RX1P Input DVI/HDMI Channel 1 Positive Data Input 8
RX2N Input DVI/HDMI Channel 2 Negative Data Input 10
RX2P Input DVI/HDMI Channel 2 Positive Data Input 11
RXCKN Input DVI/HDMI Negative Clock Input 2
RXCKP Input DVI/HDMI Positive Clock Input 3
LVDS Interface
Pin Name Pin Type Function Pin
LVA0M Output LVDS A-Link Channel 0 Negative Data Output 146
LVA0P Output LVDS A-Link Channel 0 Positive Data Output 145
LVA1M Output LVDS A-Link Channel 1 Negative Data Output 144
LVA1P Output LVDS A-Link Channel 1 Positive Data Output 143
LVA2M Output LVDS A-Link Channel 2 Negative Data Output 142
LVA2P Output LVDS A-Link Channel 2 Positive Data Output 141
LVACKM Output LVDS A-Link Negative Clock Output 140
LVACKP Output LVDS A-Link Positive Clock Output 139
LVA3M Output LVDS A-Link Channel 3 Negative Data Output 138
LVA3P Output LVDS A-Link Channel 3 Positive Data Output 137
LVB0M Output LVDS B-Link Channel 0 Negative Data Output 159
LVB0P Output LVDS B-Link Channel 0 Positive Data Output 158
LVB1M Output LVDS B-Link Channel 1 Negative Data Output 157
LVB1P Output LVDS B-Link Channel 1 Positive Data Output 156
LVB2M Output LVDS B-Link Channel 2 Negative Data Output 155
LVB2P Output LVDS B-Link Channel 2 Positive Data Output 154
LVBCKM Output LVDS B-Link Negative Clock Output 153
LVBCKP Output LVDS B-Link Positive Clock Output 152
LVB3M Output LVDS B-Link Channel 3 Negative Data Output 151
LVB3P Output LVDS B-Link Channel 3 Positive Data Output 150
Serial Flash Interface
Pin Name Pin Type Function Pin
SCK Output SPI Flash Serial Clock 129
SDI Output SPI Flash Serial Data Input 130
SDO Input w/ 5V-tolerant SPI Flash Serial Data Output 131
SCZ Output SPI Flash Chip Select 132
IRIN Input w/ 5V-tolerant IR Receiver Input 114
INT Input w/ 5V-tolerant MCU Bus Interrupt; 4mA driving strength 115
GPIO Interface
Pin Name Pin Type Function Pin
GPIO125 I/O w/ 5V-tolerant General Purpose Input/Output; 4mA driving strength 12
GPIO124 I/O General Purpose Input/Output; 4mA driving strength 135
GPIO123 I/O General Purpose Input/Output; 4mA driving strength 136
GPIO112 I/O General Purpose Input/Output; 4mA driving strength 148
GPIO111 I/O General Purpose Input/Output; 4mA driving strength 149
GPIO100 I/O General Purpose Input/Output; 4mA driving strength 164
GPIO99 I/O General Purpose Input/Output; 4mA driving strength 165
GPIO98 I/O General Purpose Input/Output; 4mA driving strength 166
GPIO97 I/O General Purpose Input/Output; 4mA driving strength 167
GPIO45/I2S_IN_BCK I/O General Purpose Input/Output; 4mA driving strength /
Audio Bit Clock Input 104
GPIO44/I2S_IN_WS I/O General Purpose Input/Output; 4mA driving strength /
Word Select Output; 4mA driving strength 103

GPIO28 I/O w/ 5V-tolerant General Purpose Input/Output; 4mA driving strength 87
GPIO27 I/O w/ 5V-tolerant General Purpose Input/Output; 4mA driving strength 86
GPIO26 I/O w/ 5V-tolerant General Purpose Input/Output; 4mA driving strength 85
GPIO25 I/O w/ 5V-tolerant General Purpose Input/Output; 4mA driving strength 84
GPIO24 I/O w/ 5V-tolerant General Purpose Input/Output; 4mA driving strength 83
GPIO23 I/O w/ 5V-tolerant General Purpose Input/Output; 4mA driving strength 82
GPIO22 I/O w/ 5V-tolerant General Purpose Input/Output; 4mA driving strength 81
GPIO21 I/O w/ 5V-tolerant General Purpose Input/Output; 4mA driving strength 80
GPIO20 I/O w/ 5V-tolerant General Purpose Input/Output; 4mA driving strength 79
GPIO15/CEC I/O General Purpose Input/Output; 4mA driving strength / Consumer Electronics Control 134
GPIO14/UART_TX1 I/O General Purpose Input/Output; 4mA driving strength / Universal Asynchronous Transmitter 196
GPIO13/UART_RX1/CEC I/O General Purpose Input/Output; 4mA driving strength / Universal Asynchronous Receiver / Consumer Electronics Control 195
PWM3 Output Pulse Width Modulation Output; 4mA driving strength 125
PWM2 Output Pulse Width Modulation Output; 4mA driving strength 124
PWM1 Output Pulse Width Modulation Output; 4mA driving strength 123
PWM0 Output Pulse Width Modulation Output; 4mA driving strength 122
SAR3 Analog Input SAR Low Speed ADC Input 3; General Purpose Input/Output 121
SAR2 Analog Input SAR Low Speed ADC Input 2; General Purpose Input/Output 120
SAR1 Analog Input SAR Low Speed ADC Input 1; General Purpose Input/Output 119
SAR0 Analog Input SAR Low Speed ADC Input 0; General Purpose Input/Output 118
DRAM Interface
Pin Name Pin Type Function Pin
DQM[3:0] Output Data Mask for Low Byte; active high 177, 188, 231, 242
DQS[3:0] I/O Data Strobe 168, 192, 221, 246
MVREF Input Reference Voltage for DDR SDRAM Interface 197
MCLKZ Output DRAM Memory Negative Differential Clock 198
MCLK Output DRAM Memory Positive Differential Clock 199
MCLKE Output DRAM Memory Clock Enable 200
BADR[1:0] Output DRAM Memory Bank Address 216, 217
WEZ Output Write Enable; active low 218
RASZ Output Row Address Strobe; active low 219
CASZ Output Column Address Strobe; active low 220
MDATA[31:0] I/O DRAM Memory Data Bus 170, 171, 173-176,
178, 179, 181-186,
189, 190, 223, 224,
226-229, 232, 233,
235-240, 243, 244
MADR[12:0] Output DRAM Memory Address 215-210, 208-202
USB Interface
Pin Name Pin Type Function Pin
USB_REXT USB External Resistor Pin;Connected through 910 ohm (±1%) Resistor to GND (Pin#253)249
USB_DM Analog I/O USB Inverting Data Input/Output 251
USB_DP Analog I/O USB Non Inverting Data Input/Output 252
Misc. Interface
Pin Name Pin Type Function Pin
DDCD_DA I/O w/ 5V-tolerant HDCP Serial Bus Data / DDC Data of DVI/HDMI Port 14
DDCD_CK Input w/ 5V-tolerant HDCP Serial Bus Clock / DDC Clock of DVI/HDMI Port 15
DDCA_DA I/O w/ 5V-tolerant DDC Data for Analog Port 116
DDCA_CK I/O w/ 5V-tolerant DDC Clock for Analog Port 117
HWRESET Schmitt Trigger Input w/ 5V-tolerant Hardware Reset; active high 128
DDCR_DA I/O w/ 5V-tolerant DDC Data for ROM 126
DDCR_CK I/O w/ 5V-tolerant DDC Clock for ROM 127
XIN Analog Input Crystal Oscillator Input 255
XOUT Analog Output Crystal Oscillator Output 254
Power Pins

Pin Name Pin Type Function Pin
AVDD_SIF 3.3V Power SIF Power 50
AVDD_AU 3.3V Power Audio Power 70
AVDD_DDR 2.5V Power DDR Power 169, 180, 191, 209,
222, 234, 245
AVDD_LPLL 3.3V Power LPLL Power 160
AVDD_MPLL 3.3V Power MPLL Power 256
AVDD_MEMPLL 3.3V Power PLL Power 201
AVDD_33 3.3V Power ADC Power 6, 32, 46
AVDDL_DVI 1.2V Power DVI Power 248
AVDD_USB 3.3V Power USB Power 250
VDDC 1.2V Power Digital Core Power 53, 89, 102, 163,
194, 230, 247
VDDP 3.3V Power Digital Input/Output Power 78, 113, 133, 147
GND Ground Ground 1, 9, 33, 49, 54, 66,
88, 101, 161, 162,
172, 187, 193, 225,
241, 253
No Connects
Pin Name Pin Type Function Pin
NC No connect. 47, 64, 65, 75

- **I201,I212 PT5DU281620VP DDRAM (RA)**

The PT5DU281620VP is a 134,217,728-bit CMOS Double Data Rate(DDR) Synchronous DRAM, ideally suited for the main memory applications which requires large memory density and high bandwidth.
This Wins 128Mb DDR SDRAMs offer fully synchronous operations referenced to both rising and falling edges of the clock. While all addresses and control inputs are latched on the rising edges of the CK (falling edges of the /CK), Data, Data strobes and Write data masks inputs are sampled on both rising and falling edges of it. The data paths are internally pipelined and 2-bit prefetched to achieve very high bandwidth. All input and output voltage levels are compatible with SSTL_2.

- **I201,I212 HYB25DC256163CE-4 DDR1 (16Mx16) (RB)**

The 256-Mbit Double-Data-Rate SGRAM is a high-speed CMOS, dynamic random-access memory containing 268,435,456 bits. It is internally configured as a quad-bank DRAM.
The 256-Mbit Double-Data-Rate SGRAM uses a double-data-rate architecture to achieve high-speed operation. The doubledata- rate architecture is essentially a 2n prefetch architecture with an interface designed to transfer two data words per clock cycle at the I/O pins. A single read or write access for the 256-Mbit Double-Data-Rate SGRAM effectively consists of a single 2n-bit wide, one clock cycle data transfer at the internal DRAM core and two corresponding n-bit wide, one-half-clock-cycle data transfers at the I/O pins.
A bidirectional data strobe (DQS) is transmitted externally, along with data, for use in data capture at the receiver. DQS is a strobe transmitted by the DDR SGRAM during Reads and by the memory controller during Writes. DQS is edge-aligned with data for Reads and center-aligned with data for Writes.
The 256-Mbit Double-Data-Rate SGRAM operates from a differential clock (CK and CK; the crossing of CK going HIGH and CK going LOW is referred to as the positive edge of CK). Commands (address and control signals) are registered at every positive edge of CK. Input data is registered on both edges of DQS, and output data is referenced to both edges of DQS, as well as to both edges of CK.Read and write accesses to the DDR SGRAM are burst oriented; accesses start at a selected location and continue for a programmed number of locations in a programmed sequence. Accesses begin with the registration of an Active command, which is then followed by a Read or Write command. The address bits registered coincident with the Active command are used to select the bank and row to be accessed. The address bits registered coincident with the Read or Write command are used to select the bank and the starting column location for the burst access.
The DDR SGRAM provides for programmable Read or Write burst lengths of 2, 4 or 8 locations. An Auto Precharge function may be enabled to provide a self-timed row precharge that is initiated at the end of the burst access. As with standard SDRAMs, the pipelined, multibank architecture of DDR SGRAMs allows for concurrent operation, thereby providing high effective bandwidth by hiding row precharge and activation time.

An auto refresh mode is provided along with a power-saving power-down mode. All inputs are compatible with the Industry Standard for SSTL_2. All outputs are SSTL_2, Class II compatible. Note: The functionality described and the timing specifications included in this data sheet are for the DLL Enabled mode of operation.

- **I501 Tuner**

The Antenna receive the TV signal and modulate it to the CVBS signal and ATSC signal which can be recognized By the decoder and MTS audio signal output to the sound multiplexing decoder portion of IC MSD2248AL

- **I601 YDA148 AUDIO AMP**

YDA148 (D-510) is a high-efficiency digital audio power amplifier IC with the maximum output of 15W × 2ch.
YDA148 has a "Pure Pulse Direct Speaker Drive Circuit" that directly drives speakers while reducing distortion of pulse output signal and reducing noise on the signal, which realizes the highest standard low distortion rate characteristics and low noise characteristics among digital amplifier ICs in the same class.
In addition, supporting filterless design allows circuit design with fewer external parts to be realized depending on use conditions.
YDA148 features Power Limit Function, Non-clip Function, and DRC (Dynamic Range Control) Function that were developed by Yamaha original digital amplifier technology.
YDA148 has overcurrent protection function for speaker output terminals, high temperature protection function, and lowsupply voltage malfunction prevention function.

- **I601 TPA6113A2**

The TPA6113A2 is a stereo audio power amplifier packaged in an 8-pin SOIC package capable of delivering 40mW of continuous RMS power per channel into 16-Ω loads Amplifier gain is extermally configured by means of two resistors per input channel and does not require external compensation for settings of 0 to 20 dB.

- **I202 MSD809**

The MSD809 is a DTV receiver, which contains a digital receiver compatible with ATSC 8-VSB mode for terrestrial broadcasting and open cable (SCTE DVS-031) which is in compliant with 64-QAM and 256-QAM modes for digital cable appliances.
It achieves extremely high performance employing direct IF sampling architecture,robust synchronization, and robust channel equalization. It contains a 12-bit A/D converter and a PWM generator for automatic gain control. A host interface with an I2C bus is also included to control the behavior of the MSD809.

- **I404 AML7228**

The heart of USB port [AML7228 A/V processor] is a complete integrated system targeting all types of Audio/Video decoder applications that provide connectivity to hard disk, digital camera, memory cards and other external digitalconsumer devices. The target market for AML7228 A/V processor is LCD TVs and portable media players.
The AML7228 combines full function of MPEG-1, MPEG-2, MPEG-4 and RealVideo decoding, numerous dedicated and general-purpose peripherals, and a high speed 32-bit host CPU in a single device. The AML7228 has two built-in AMRISCTM RISC processors with special instructions to accommodate audio and video digital signal processing. The AML7228 device provides many on-chip I/O peripherals. The peripherals include dual USB 2.0 High-Speed OTG controllers and PHYs; transport de-mux; and memory card reader controllers.
The embedded 32-bits core CPU handles all system related application software. It executes AVOS, the base operating system for AML7228. All applications and drivers run on top of AVOS. Drivers includingUSB drivers, SD hardware driver, and other hardware related programming interfaces are provided by AVOS. Applications include graphical user interfaces and file system sub-system are also included.Developers can add additional applications to customize for each platform.
The core CPU interfaces to the video and audio processing hardware. MPEG1/2/4, HVD, RealVideo and JPEG/M-JPEG streams are processed by dedicated video decoding hardware and the flexible VideoAMRISCTM engine. The hardware and microcode combination is capable of decoding normal D1 size video sequence at full speed, and JPEG pictures with no limits. Pixel based de-interlacing is applied to the video sequence for high quality video output.

Once decoded, the output pictures are passed to a sophisticated video sub-system that performs video enhancement and scaling functions. Contrast enhancement, hue adjustment, video scaling, video interpolation, pan-scan, letter-box, and zoom are also supported. The scalar supports both up-scaling and down-scaling of images and video. The scalar can also mix in multiple graphics and OSD layers for the final display. The integrated video encoder supports all video resolutions from traditional NTSC/PAL to 1080p high definition video output thru the on-chip triple video DACs.
The integrated Audio AMRISCTM RISC processor performs advanced digital audio decoding and postprocessing. The micro-coded engine provides support for all existing audio formats and it also hasenough flexibility to accommodate new audio standards. Popular audio formats like MPEG, LPCM, Dolby. AC-3 5.1, HDCD, MP-3, WMA, AAC, RealAudio and FLAC can be supported.
The AML7228 also integrated two USB 2.0 High Speed OTG controllers and PHYs for connecting to USB hard disk, FLASH memory. The AVOS drivers and applications for AML7228 firmware includes the basic USB device driver, USB protocol stacks to support bulk and INTR transfer, Hub, Mass-Storage (MS) class, Picture Transfer Protocol (PTP) and PictBridge protocol. The AVOS USB firmware also supports multiple file systems and includes flexible file transfer functions between USB devices.

- **I410 PIC12F675**

A microprocessor to power-on the TV set when receiving the power-on code from RS232.

5. Adjusting Procedure

5.1. ADJUSTMENT CONDITIONS AND PRECAUTIONS

1. Approximately 30 minutes should be allowed for warm up before proceeding.
2. Adjustments should be undertaken only on those necessary elements since most of them have been carefully preset at the factory.
3. ESD protection is needed before adjustment.

5.2. MAIN ADJUSTMENTS

NO. FUNCTION	DESIGNATION
1. EEPROM Initial	Function Key
2. Adjust color temperature	Function Key

5.3. ALIGNMENT PROCEDURES

Adjustment Conditions and Precautions:

(A). Power supply voltage:AC 110V± 10% 50 Hz ± 5%.

(B). Warm up time:

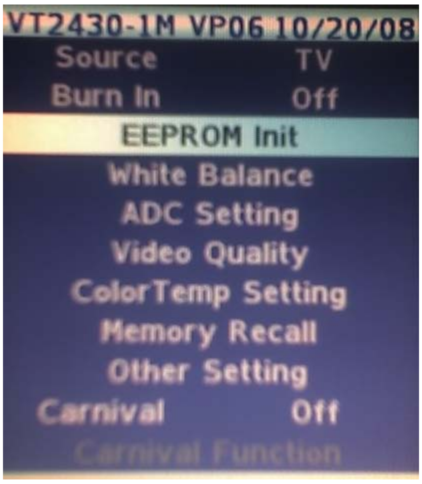
The display must be power ON for at least 30 minutes at full white pattern before starting alignments.

This is especially critical in color temperature and white balance adjustments.

(C). Video : reference the front detail specifications.

1. Eeprom Initial:

Press “ MENU ”and “▲” and “POWER” key go to factory mode.



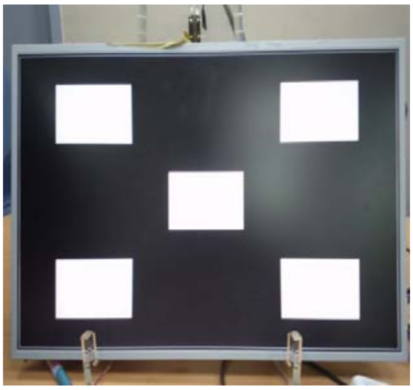
2. Adjust color temperature

A. Enter to the factory mode, Source select “ D_Sub” figure 2, Use 1920x1080@60Hz the pattern is “ 5 block ” figure 1,then move the cursor to the White Balance figure 3. Press “►” key. That will do auto white balance.

B. After auto white balance, switch to the full white pattern then check the color temperature.

WARM	x=0.335 ± 0.03	y=0.350 ± 0.03
NORMAL	x=0.313 ± 0.03	y=0.329 ± 0.03
COOL	x=0.283 ± 0.03	y=0.298 ± 0.03

C. Enter to the factory mode, Source select “ YPbPr ”, Use NTSC Color Bar (FLUKE 54200) Figure 4, Set Color bar to 100 IRE then move the cursor to the White Balance figure 5. Press “►” Key figure 6. That will do auto white balance. Finally change 16 gray scale must be claire in each grays.


figure 1

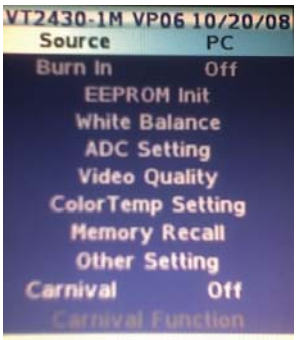


figure 2

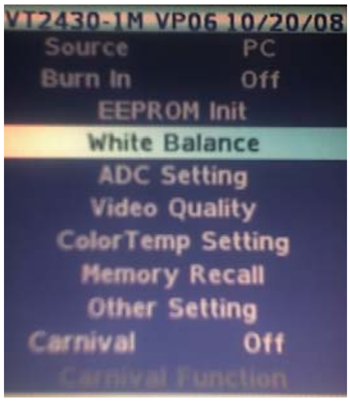


figure 3


figure 4

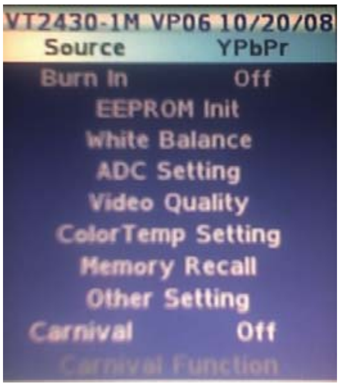


figure 5

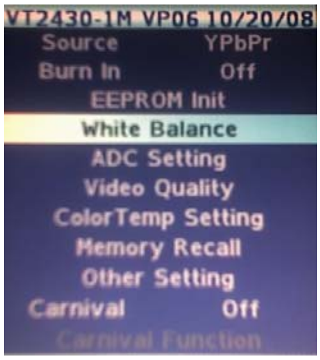


figure 6

3. Power Consumption Check (VGA MODE)

A. TIMING: 1920 x 1080@60Hz
B. Pattern: 1010UPRIGHTNESS PATTERN
C. BRIGHTNESS=MAX, CONTRAST=MAX.
D. The power that each MODE consumed is shown in Chart 1.

MODE	MAX POWER COMSUMED	POWER LED COLOR
NORMAL	75W(max)	BLUE
Stand-by	2W (max)	ORANGE

Chart 1

4. Check the position of the picture displayed and phase auto adjusting (VGA MODE).
Depend on the TIMING of TIMING TABLE (TABLE 4) to switch MODE in order, stay about 10 seconds each MODE, it can changed and stored automatically each MODE. We can't switch over to the next MODE until AUTO ADJUST disappears.

5. HDMI MODE FUNCTION TEST
A.DVI MODE: Depend on the TIMING of TIMING TABLE (TABLE 3) to check MODE in order.
B.HDMI MODE: make sure the 480i, 480p, 720p, 1080i,1080p TIMING is right.

6. OSD FUNCTION TEST
Time:1920*1080@60Hz
Pattern: 16*12 pane
Make sure that Each FUNCTION has one right action.

7. DTV FUNCTION TEST
Both NTSC and ATSC system were mixed together. At this point in tuner to the joints on the need for 'AIR NTSC and ATSC 2 both systems were mixed with the signal
Both CATV and DIGITAL CABLE two systems are mixed together. At this point in tuner to the need for a joint 'CATV and DIGITAL CABLE two systems are mixed in a the signal

8. YPbPr, S-VIDEO, AV, TV, DTV'S FUNCTION TEST
A. Input YPbPr, S-VIDEO, AV , TV, DTV'S signal and check.
B. Input USA air channel (TABLE 1) and USA CATV channel for TV channel.
Under YPbPr MODE, Make sure the 408i, 480P, 720P, 1080i,1080p is right.

9. USB mode FUNCTION TEST
A. Insert a USB flash memory which has .avi movies and .jpeg photos inside for testing.
Make sure the "MOVIE" function works normally in video and audio.
B. Choose the "PHOTO" function from the USB menu and select a 100 IRE color bar pattern to make sure to the colors and brightness are right.
C. Choose the "SET UP" function and press the "Defult" item on the bottom before quit if any set up function is changed while testing.

10. AUDIO FUNCTION TEST
A. Audio input includes PC AUDIO IN, S-VIDEO/AV AUDIO IN and YPbPr/DVI AUDIO IN.
B. Under PC MODE, input PC AUDIO signal, checks whether the action of AUDIO IN is right.
C. Under S-VIDEO/AV MODE, input L/R AUDIO signal, checks whether the action of AUDIO IN is right.
D. Under YPbPr MODE, input L/R AUDIO signal, checks whether the action of AUDIO IN is right.Under HDMI MODE, checks whether the action of AUDIO IN is right Under TV MODE, checks whether the action of AUDIO IN is right.
E. In DTV mode, the input signal ATSC, confirmed AUDIO LANGUAGE and the normal movements PARENT

11.Under PC MODE, input PC AUDIO signal, determines whether the action of INT SPEAKER output is right. Meets earphone with the EARPHONE, Determined whether the action of EARPHONE output is normal.

12.DDC EDID confirm
VGA EDID confirm
By P502 VGA CONNECTOR DOWNLOAD EDID confirm whether normal or not
HDMI EDID confirm
By P501 HDMI CONNECTORS DOWNLOAD EDID confirm whether normal or not

13.All Modes Reset
After final QC step, we must to erase all saved changes again and restore the factory defaults.
You should do "memory recall " again.
Turn off the LCD TV by pressing "Power" button

14.BURN IN Mode access methods
Key Pad followed by pressing the "MENU" + "INPUT" 2 KEY, entered BURN IN mode

15.DCR function confirm In all source. (VTMS2431M model only)
A. DCR turn ON.
B. Input full white pattern then measure the luminance. For example Value A
C. Input full dark pattern the measure the luminace. For example Value B
D. These two value ratio must be more than 10000. (A/B).

TV Frequency Table:
U.S.A Channel (TABLE 1)
VIF 45.75 MHz, SIF 41.25 MHz

(Unit：MHz)

Ch.	Freq.range	fp (picture)	fs (sound)	fosc	Ch.	Freq.range	fp (picture)	fs (sound)	fosc
2	54 – 60	55.25	59.75	101.00	43	644 – 650	645.25	649.75	691.00
3	60 – 66	61.25	65.75	107.00	44	650 – 656	651.25	655.75	697.00
4	66 – 72	67.25	71.75	113.00	45	656 – 662	657.25	661.75	703.00
5	76 – 82	77.25	81.75	123.00	46	662 – 668	663.25	667.75	709.00
6	82 – 88	83.25	87.75	129.00	47	668 – 674	669.25	673.75	715.00
7	174 – 180	175.25	179.75	221.00	48	674 – 680	675.25	679.75	721.00
8	180 – 186	181.25	185.75	227.00	49	680 – 686	681.25	685.75	727.00
9	186 – 192	187.25	191.75	233.00	50	686 – 692	687.25	691.75	733.00
10	192 – 198	193.25	197.75	239.00	51	692 – 698	693.25	697.75	739.00
11	198 – 204	199.25	203.75	245.00	52	698 – 704	699.25	703.75	745.00
12	204 – 210	205.25	209.75	251.00	53	704 – 710	705.25	709.75	751.00
13	210 – 216	211.25	215.75	257.00	54	710 – 716	711.25	715.75	757.00
14	470 – 476	471.25	475.75	517.00	55	716 – 722	717.25	721.75	763.00
15	476 – 482	477.25	481.75	523.00	56	722 – 728	723.25	727.75	769.00
16	482 – 488	483.25	487.75	529.00	57	728 – 734	729.25	733.75	775.00
17	488 – 494	489.25	493.75	535.00	58	734 – 740	735.25	739.75	781.00
18	494 – 500	495.25	499.75	541.00	59	740 – 746	741.25	745.75	787.00
19	500 – 506	501.25	505.75	547.00	60	746 – 752	747.25	751.75	793.00
20	506 – 512	507.25	511.75	553.00	61	752 – 758	753.25	757.75	799.00
21	512 – 518	513.25	517.75	559.00	62	758 – 764	759.25	763.75	805.00
22	518 – 524	519.25	523.75	565.00	63	764 – 770	765.25	769.75	811.00
23	524 – 530	525.25	529.75	571.00	64	770 – 776	771.25	775.75	817.00
24	530– 536	531.25	535.75	577.00	65	776 – 782	777.25	781.75	823.00
25	536 – 542	537.25	541.75	583.00	66	782 – 788	783.25	787.75	829.00
26	542 – 548	543.25	547.75	589.00	67	788 – 794	789.25	793.75	835.00
27	548 – 554	549.25	553.75	595.00	68	794 – 800	795.25	799.75	841.00
28	554 – 560	555.25	559.75	601.00	69	800 – 806	801.25	805.75	847.00
29	560 – 566	561.25	565.75	607.00					
30	566 – 572	567.25	571.75	613.00					
31	572 – 578	573.25	577.75	619.00					
32	578 – 584	579.25	583.75	625.00					
33	584 – 590	585.25	589.75	631.00					
34	590 – 596	591.25	595.75	637.00					
35	596 – 602	597.25	601.75	643.00					
36	602 – 608	603.25	607.75	649.00					
37	608 – 614	609.25	613.75	655.00					
38	614 – 620	615.25	619.75	661.00					
39	620 – 626	621.25	625.75	667.00					
40	626 – 632	627.25	631.75	673.00					
41	632 – 638	633.25	637.75	679.00					
42	639 – 644	639.25	643.75	685.00					

U.S.A. CATV (TABLE 2)
VIF 45.75 MHz, SIF 41.25 MHz

(Unit：MHz)

Ch.		Freq.range	fp (picture)	fs (sound)	fosc	Ch.		Freq.range	fp (picture)	fs (sound)	fosc
2	2	54 – 60	55.25	59.75	101.00	JJ	46	354 –360	355.25	359.75	401.00
3	3	60 – 66	61.25	65.75	107.00	KK	47	360 –366	361.25	365.75	407.00
4	4	66 – 72	67.25	71.75	113.00	LL	48	366 –372	367.25	371.75	413.00
5A	1	72 – 78	73.25	77.75	119.00	MM	49	372 –378	373.25	377.75	419.00
5	5	76 – 82	77.25	81.75	123.00	NN	50	378 –384	379.25	383.75	425.00
6	6	82 – 88	83.25	87.75	129.00	OO	51	384 –390	385.25	389.75	431.00
A-5	95	90 – 96	91.25	95.75	137.00	PP	52	390 –396	391.25	395.75	437.00
A-4	96	96 – 102	97.25	101.75	143.00	QQ	53	396 –402	397.25	401.75	443.00
A-3	97	102 – 108	103.25	107.75	149.00	RR	54	402 –408	403.25	407.75	449.00
A-2	98	108 – 114	109.25	113.75	155.00	SS	55	408 –414	409.25	413.75	455.00
A-1	99	114 – 120	115.25	119.75	161.00	TT	56	414 –420	415.25	419.75	461.00
A	14	120 – 126	121.25	125.75	167.00	UU	57	420 –426	421.25	425.75	467.00
B	15	126 – 132	127.25	131.75	173.00	VV	58	426 –432	427.25	431.75	473.00
C	16	132 – 138	133.25	137.75	179.00	WW	59	432 –438	433.25	437.75	479.00
D	17	138 – 144	139.25	143.75	185.00	AAA	60	438 –444	439.25	443.75	485.00
E	18	144 – 150	145.25	149.75	191.00	BBB	61	444 –450	445.25	449.75	491.00
F	19	150 – 156	151.25	155.75	197.00	CCC	62	450 –456	451.25	455.75	497.00
G	20	156 – 162	157.25	161.75	203.00	DDD	63	456 –462	457.25	461.75	503.00
H	21	162 – 168	163.25	167.75	209.00	EEE	64	462 –468	463.25	467.75	509.00
I	22	168 – 174	169.25	173.75	215.00		65	468 –474	469.25	473.75	515.00
7	7	174 – 180	175.25	179.75	221.00		66	474 –480	475.25	479.75	521.00
8	8	180 – 186	181.25	185.75	227.00		67	480 –486	481.25	485.75	527.00
9	9	186 – 192	187.25	191.75	233.00		68	486 –492	487.25	491.75	533.00
10	10	192 – 198	193.25	197.75	239.00		69	492 –498	493.25	497.75	539.00
11	11	198 – 204	199.25	203.75	245.00		70	498 –504	499.25	503.75	545.00
12	12	204 – 210	205.25	209.75	251.00		71	504 –510	505.25	509.75	551.00
13	13	210 – 216	211.25	215.75	257.00		72	510 –516	511.25	515.75	557.00
J	23	216 – 222	217.25	221.75	263.00		73	516 –522	517.25	521.75	563.00
K	24	222 – 228	223.25	227.75	269.00		74	522 –528	523.25	527.25	569.00
L	25	228 – 234	229.25	233.75	275.00		75	528 –534	529.25	533.75	575.00
M	26	234 – 240	235.25	239.75	281.00		76	534 –540	535.25	539.75	581.00
N	27	240 – 246	241.25	245.75	287.00		77	540 –546	541.25	545.75	587.00
O	28	246 – 252	247.25	251.75	293.00		78	546 –552	547.25	551.75	593.00
P	29	252 – 258	253.25	257.75	299.00		79	552 –558	553.25	557.75	599.00
Q	30	258 – 264	259.25	263.75	305.00		80	558 –564	559.25	563.75	605.00
R	31	264 – 270	265.25	269.75	311.00		81	564 –570	565.25	569.75	611.05
S	32	270 – 276	271.25	275.75	317.00		82	570 –576	571.25	575.75	617.00
T	33	276 – 282	277.25	281.75	323.00		83	576 –582	577.25	581.75	623.00
U	34	282 – 288	283.25	287.75	329.00		84	582 –588	583.25	587.75	629.00
V	35	288 – 294	289.25	293.75	335.00		85	588 –594	589.25	593.75	635.00
W	36	294 – 300	295.25	299.75	341.00		86	594 –600	595.25	599.75	641.00
AA	37	300 – 306	301.25	305.75	347.00		87	600 –606	601.25	605.75	647.00
BB	38	306 – 312	307.25	311.75	353.00		88	606 –612	607.25	611.75	653.00
CC	39	312 – 318	313.25	317.75	359.00		89	612 –618	613.25	617.75	659.00
DD	40	318 – 324	319.25	323.75	365.00		90	618 –624	619.25	623.75	665.00
EE	41	324 – 330	325.25	329.75	371.00		91	624 –630	625.25	629.75	671.00
FF	42	330 – 336	331.25	335.75	377.00		92	630 –636	631.25	635.75	677.00
GG	43	336 – 342	337.25	341.75	383.00		93	636 –642	637.25	641.75	693.00
HH	44	342 – 348	343.25	347.75	389.00		94	642 –648	643.25	647.75	689.00
II	45	348 – 354	349.25	353.75	395.00						

DIGITAL CABLE TV Frequence Table (table 3)
U.S.A Channel Frequency Assignments (Cable)
unit:MHz.

CH NO.	DTV Center Freq	CH NO.	DTV Center Freq	CH NO.	DTV Center Freq
2	57	43	339	84	585
3	63	44	345	85	591
4	69	45	351	86	597
5	79	46	357	87	603
6	85	47	363	88	609
7	177	48	369	89	615
8	183	49	375	90	621
9	189	50	381	91	627
10	195	51	387	92	633
11	201	52	393	93	639
12	207	53	399	94	645
13	213	54	405	95	93
14	223	55	411	96	99
15	129	56	417	97	105
16	135	57	423	98	111
17	141	58	429	99	117
18	147	59	435	100	651
19	153	60	441	101	657
20	159	61	447	102	663
21	165	62	453	103	669
22	171	63	459	104	675
23	219	64	465	105	681
24	225	65	471	106	687
25	231	66	477	107	693
26	237	67	483	108	699
27	243	68	489	109	705
28	249	69	495	110	711
29	255	70	501	111	717
30	261	71	507	112	723
31	267	72	513	113	729
32	273	73	519	114	735
33	279	74	525	115	741
34	285	75	531	116	747
35	291	76	537	117	753
36	297	77	543	118	759
37	303	78	549	119	765
38	309	79	555	120	771
39	315	80	561	121	777
40	321	81	567	122	783
41	327	82	573	123	789
42	333	83	579	124	795

TTV receiving test:
TV SIGNAL TEST ITEM
CENTRALISM TRANSMITTING SIGNAL CHECK CONTENT

CHANNEL ORDER	FREQUENCY (MHz)	SET CONTENT			CHECK CONTENT
		PATTERN	SOUND	P/S(dB)	
CHANNEL 2	55.25	MONO SCOPE	SWEEP TONE	-10	ELECTRIC ABNORMITY SOUND
CHANNEL 6	83.25	COLOR BAR	400Hz	-10	SOUND ,PICTURE
CHANNEL 7	175.25	Full White (100 IRE)	STEREO	-10	STERO FUNCTION
CHANNEL 13	211.25	STAIR	DUAL	-10	SUB FUNCTION
CHANNEL 14	471.25	MULTIBURST	MONO	-16	IMAGE AND SOUND DISTURB
CHANNEL 36	603.25	MULTIBURST	MONO	-10	TEST Close-caption T1 FUNCTION
CHANNEL 69	801.25	MONO SCOPE	MONO(1KHz)	-10	NOISE LIMMITTED SENSITIVITY

TV TEST METHOD

A.CHANNEL2 Examines sound by ear, whether the sound does have mechanical resonation and the electrical unusual sound, and image to sound disturbance.
B.CHANNEL6: Check sound and picture.
C.CHANNEL7: Examines whether the sound does receive the image disturbance, Judgment basis: Whether there is unusual sound, input signal LEVEL<=36dBu,and STEREO SENSITIVITY is normal.
D.CHANNEL13: Under main/sub/main-sub mode, check sub function.
E.CHANNEL14: Examines whether the sound does receive the image disturbance, Judgment basis: Whether there is unusual sound.
F. CHANNEL 36:Check T1 of close-caption. Input signal level<=45dBu.
G.CHANNEL 69: Adjustment attenuator, If the critical point of the change of the image signal to noise ratio is under LEVEL<=60dBu, regards as normally.

PRODUCTS OUTPUT CHECK ITEM.
The same as " CENTRALISM TRANSMITTING SIGNAL CHECK CONTENT"
saturation TEST, inputs the TV signal, the input signal LEVEL establishment most greatly is 90dBu,check whether CONTRAST of the image is normal; Whether appears the disturbance phenomenon.
C.AFT CHECK,
(1) The frequency of the input TV signal is 211.25MHz (CH13), after confirmed the TV set receives this signal, closure radio station; Then set frequency of the TV signal generator to be 212.25MHz, turn on the TV set and check whether the TV set receives the signal of CH13.
(2). The frequency of the input TV signal is 211.25MHz (CH13), after confirmed the TV set receives this signal, closure radio station; Then set frequency of the TV signal generator to be 212.00MHz, turn on the TV set and check whether the TV set receives the signal of CH13.
(3). After all of FUNCTION TEST completed, we must erase all saved changes again and restore the factory defaults.

DTV TEST ITEM

CHANNEL	FREQUENCY	SOUND	dB	PETTEN	CHECK CONTENT
14	471.25MHz	Y	50	Dynamic picture	Picture
36	603.25MHz	Y	50	Color bar	Color
69	801.25MHz	Y	75	Dynamic picture	Sound and Picture

DTV CHECK METHOD
A.CHANNEL14: Check whether there are some pause or the mosaic phenomenon in the picture.
B.CHANNEL36: Check whether the color of the color bar is normal.
C.CHANNEL69: Turn RF attenuator and check the critical point of the change of the image’s S/N is under LEVEL<45~85> dBu, regards as normally.
TIMING TABLE (FACTORY PRESET MODE) (table 4)

No	Resolution	V-freq	D-SUB	DVI TO HDMI	HDMI
1	1920x1080	60	YES	NO	NO
2	1680x1050	59.8	YES	NO	NO
		60	YES	NO	NO
3	1440x900	59.8	YES	NO	NO
		59.9	YES	NO	NO
4	1280x1024	60	YES	NO	NO
		75	YES	NO	NO
5	1024x768	60	YES	YES	YES
		75	YES	NO	NO
6	832x624	75	YES	YES	YES
7	800x600	60	YES	YES	YES
		75	YES	YES	YES
8	640x480	60	YES	YES	YES
		75	YES	YES	YES
9	720x400	70	YES	YES	YES

5. 4 Firmware Upgrade Procedure

When you receive the returned LCD TV, please check whether the firmware version is the latest. If not, please do the following procedures to upgrade it to the latest version.

5.4.1 Equipment Needed
- VTMS2431M LCD TV
- Fixture for Firmware Upgrade
- VGA Cable
- PC (Personal Computer)
- Firmware Upgrade Program
- One additional LCD TV for checking the program execution
- USB flash memory

5.4.2 Connection PC to the Tv set by the tool as the follow picture (pc1~pc3)
Action: The D_SUB cable must be 15 pin, and the TV set must be AC ON



pc.1



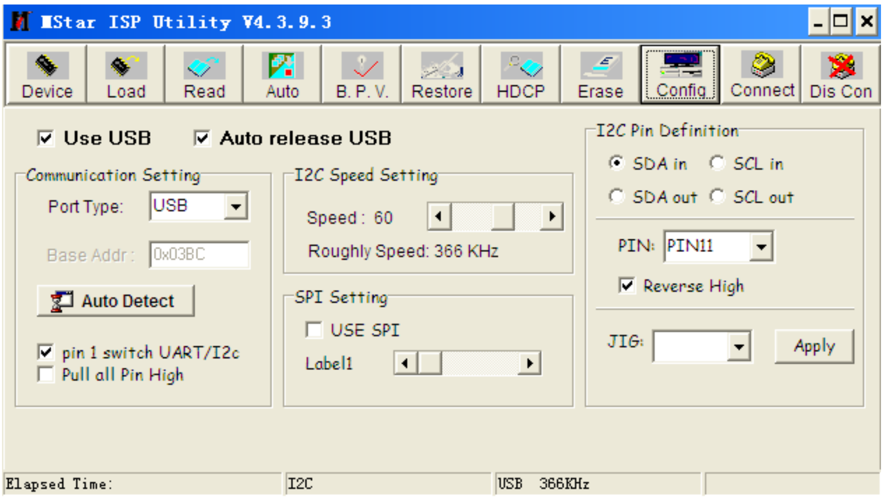
pc 2



pc 3

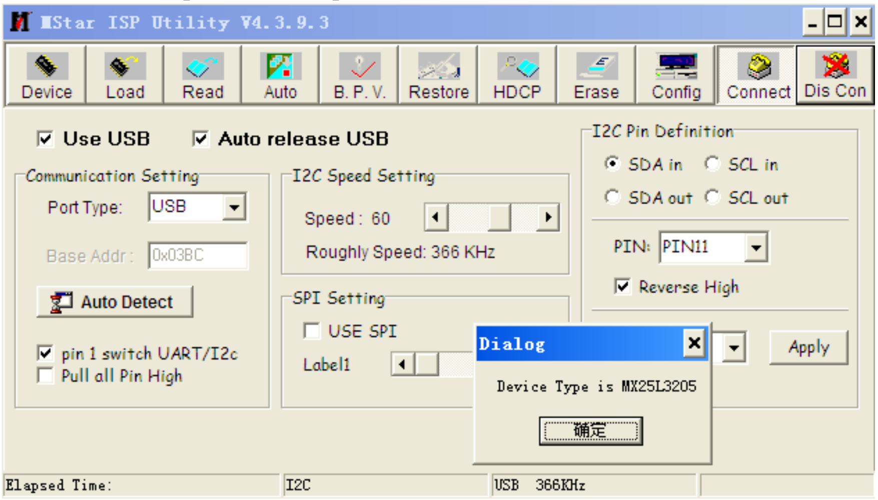
5.4.3 Start the Isp

1. Open the “I.exe”
2. Press the “config” , if the the **ISP board** have been found ,you will see the picture as bellow.



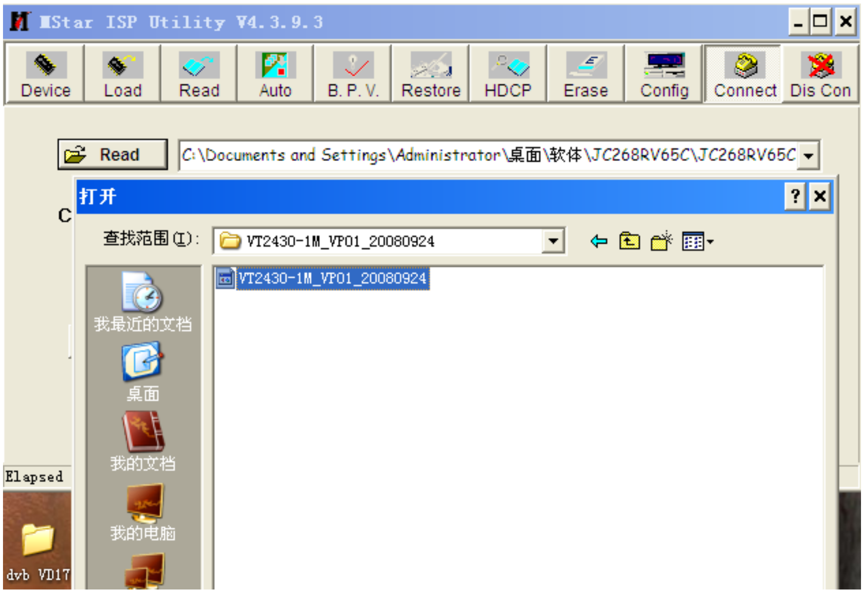
pc.4

3. Press the “Connect” ,If all the things are ok and ready, it will show the device type as the bellow picture. Than pres “確定”



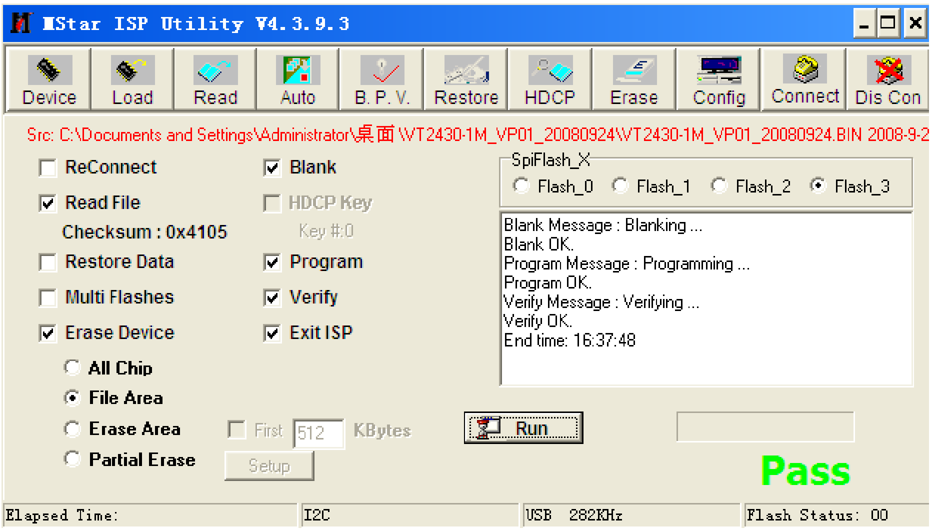
pc.5

4. Press “read” and choose the right F/W .



pc.6

5. Press “Auto”, than press “Run”. It will start ISP . When the ISP is ok ,you will see the information as the bellow picture.



pc.7

6. Pull away the AC power Cord and the D-SUB Cable. And start another TV set. When we start another TV set with AC ON, we only need to press the “RUN”

5.4.4 USB firmware upgrade

1. Put the new version firmware file (a file name with “.img” sub filename) into the flash memory
2. Select the file from the “File” function of the USB menu and press enter
3. Follow the OSD operation instruction to the end.
4. The USB function will be re-load if the upgrade is successful. While upgrading be sure to keep the TV power on and avoid any unnecessary remote operation also be sure to to keep TV away from other remote contral operation for these may cause the USB function shut down and never work again.

5.5 VGA DDC Key In Procedure

Note:
1. Every time after replacing the main board, you have to do the DDC key in.
2. If you find the DDC does not conform to the LCD TV, you have to do the DDC key in.

5.5.1 Equipment Needed
- VTMS2431M LCD TV
- DDC Card
- PC
- RS-232 cable
- Barcode Reader
- VGA Cable



VTMS2431M LCD TV



DDC Card



PC



RS-232 Cable



VGA Cable



Barcode Reader

5.5.2 Setup Procedure

1. Connect VGA Card and DDC Card with RS-232 cable.



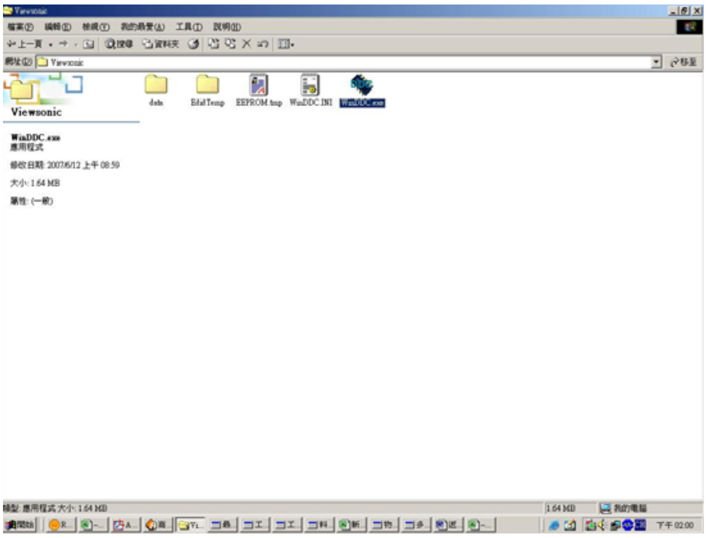
2. Barcode Reader connects with keyboard and PC keyboard port.



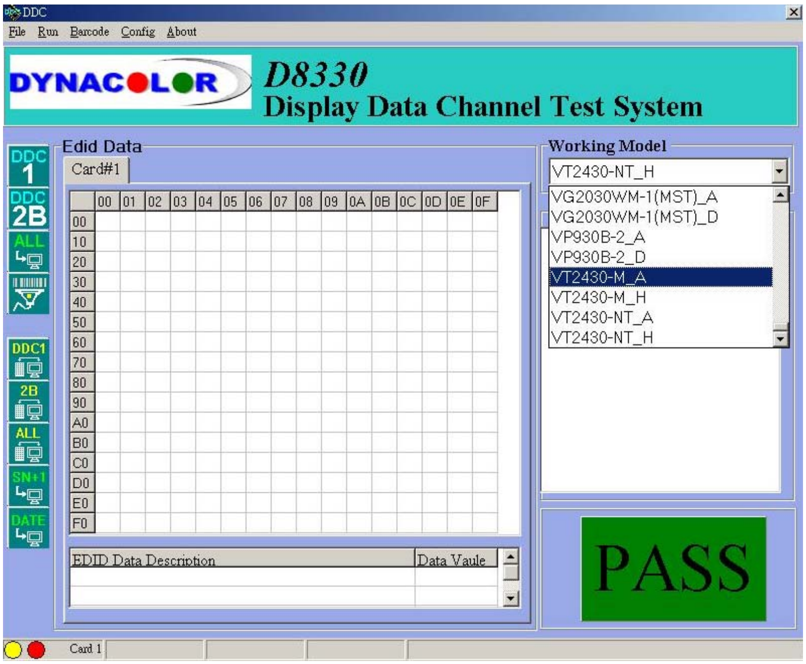
3. Connect DDC Card and VTMS2431M LCD TV with VGA Cable.
(when key in DVI DDC information, use VGA transform to DVI port)
4. Connect Power Cord to VT2430-1M LCD TV.
5. Press 'MENU'and 'ENTER' at the same time, then go into the BURN IN MODE.

5.5.3 DDC Key In Procedure

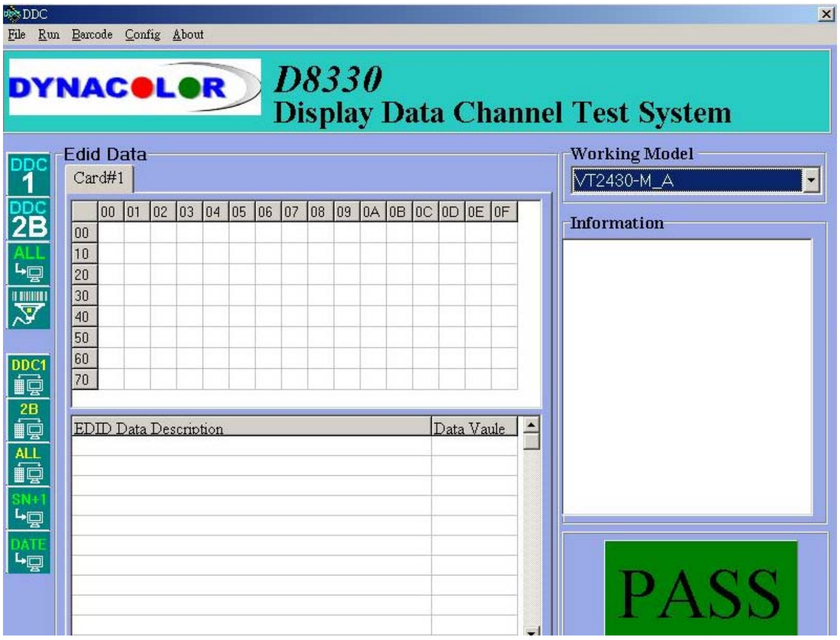
1. run DDC exe



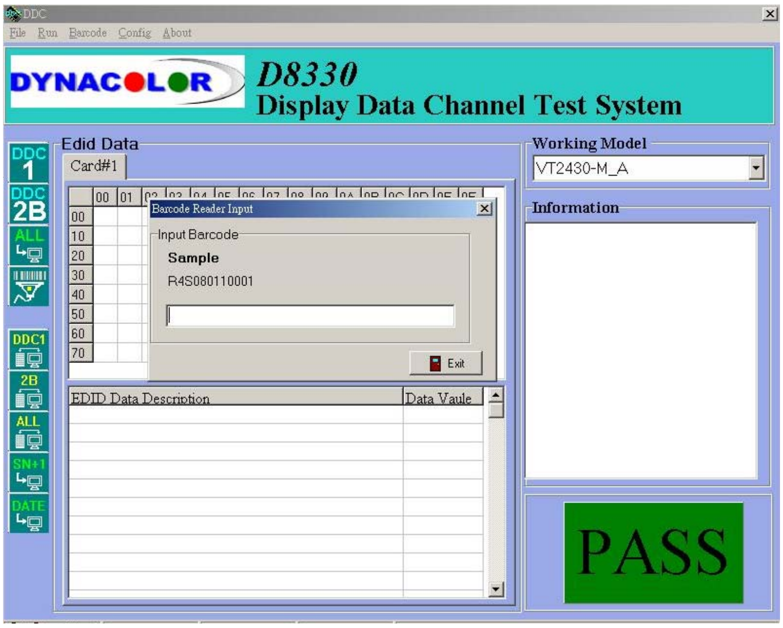
2. Choose model number the

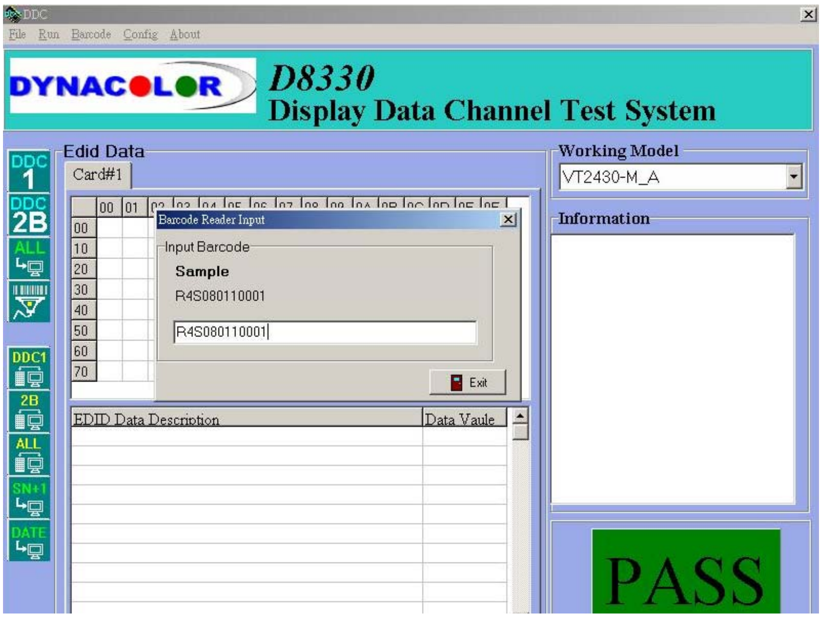


3. Press “ENTER” key.

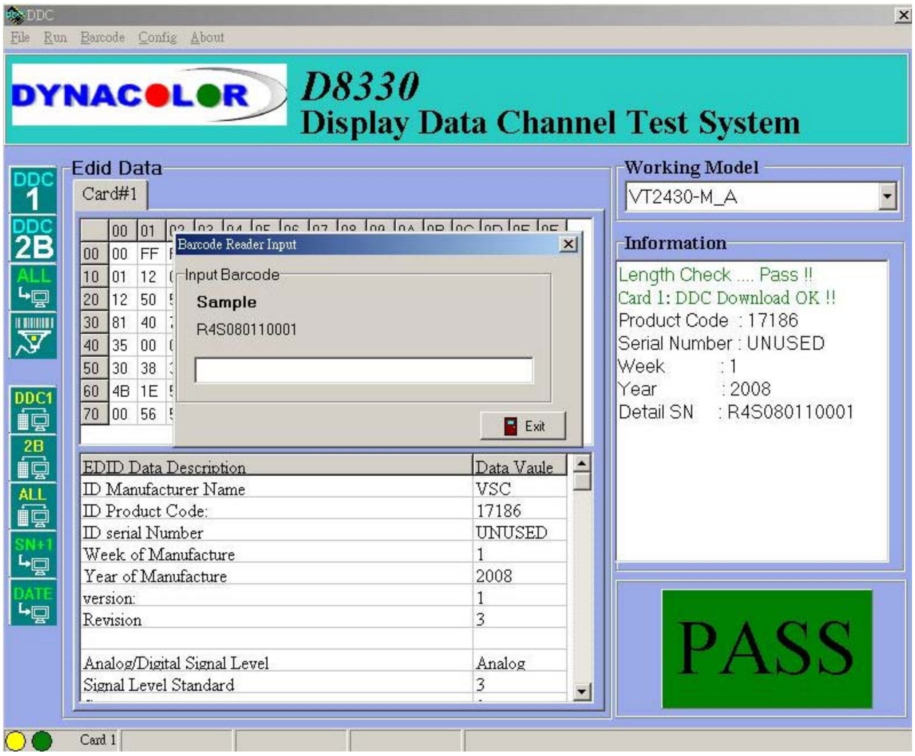


4. Press "F4" key and Input bar code





5. Press “ENTER” key, then the successful picture is as follows. “DDC DOWNLOED OK!



6. Exit program.

5.6 HDMI DDC Key In Procedure

There are three EDID files for the different HDMI connectors. So you must be download the different EDID into each HDMI connector.

5.6.1 Equipment Needed

- VTMS2431M LCD TV
- PC
- RS-232 cable
- Barcode Reader
- HDMI Cable
-



VTMS2431M LCD TV



PC



RS-232 Cable



HDMI Cable



Barcode Reader

5.6.2 Setup Procedure

1. Connect HDMI Card and DDC Card with RS-232 cable.



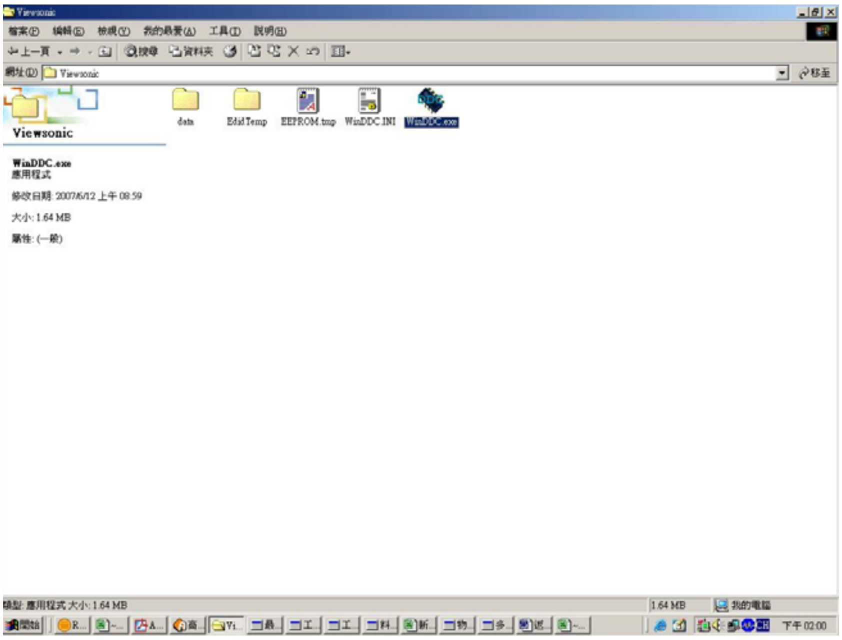
2. Barcode Reader connects with keyboard and PC keyboard port.



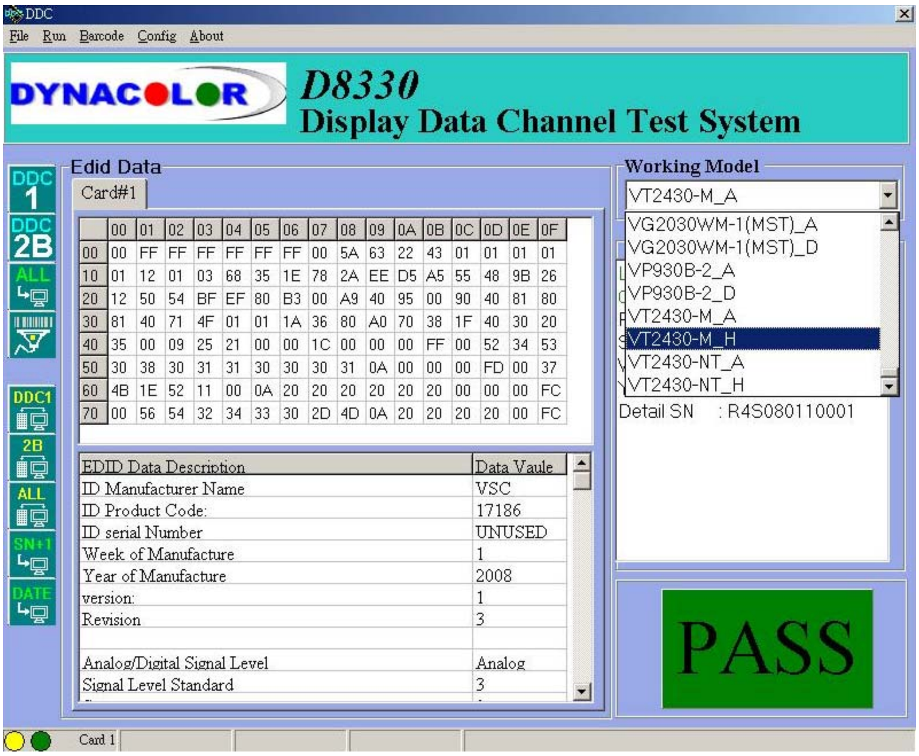
3. Connect DDC Card and VTMS2431M LCD TV with HDMI Cable.
4. Connect Power Cord to VTMS2431M LCD TV.

5.6.3 DDC Key In Procedure

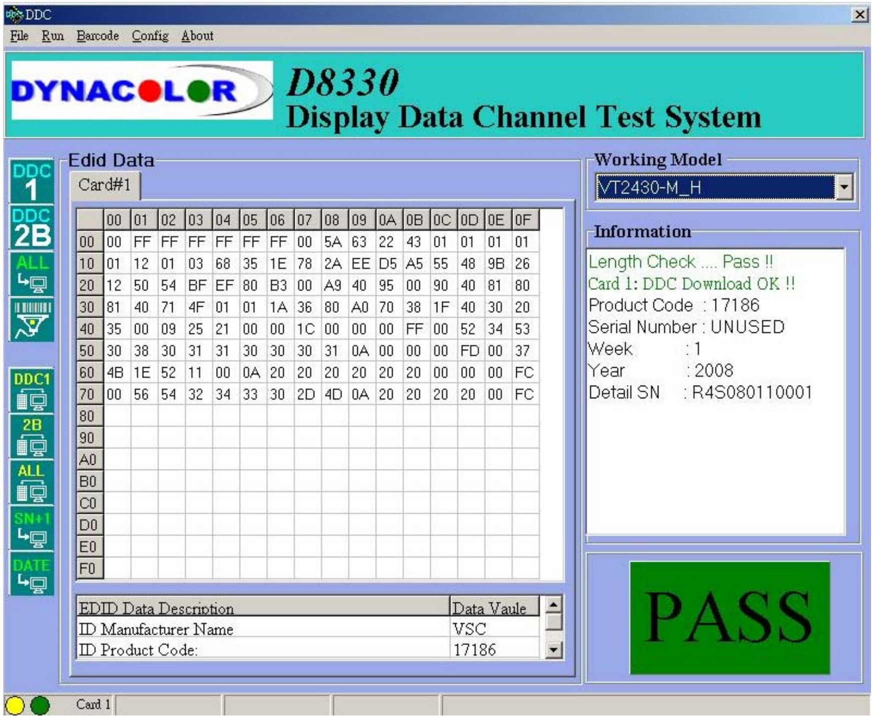
1. Run DDC.exe



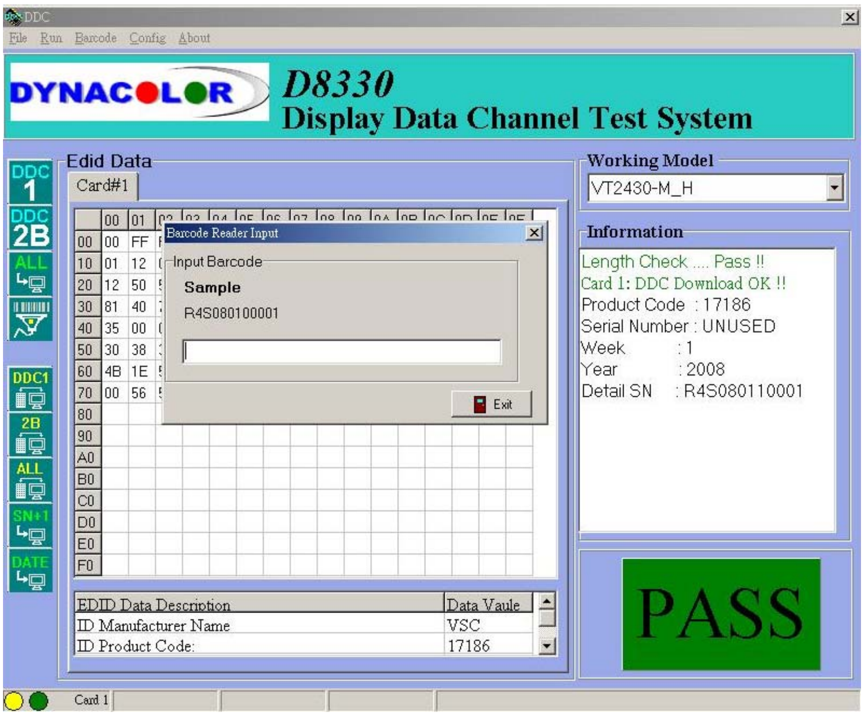
2. Choose model number then



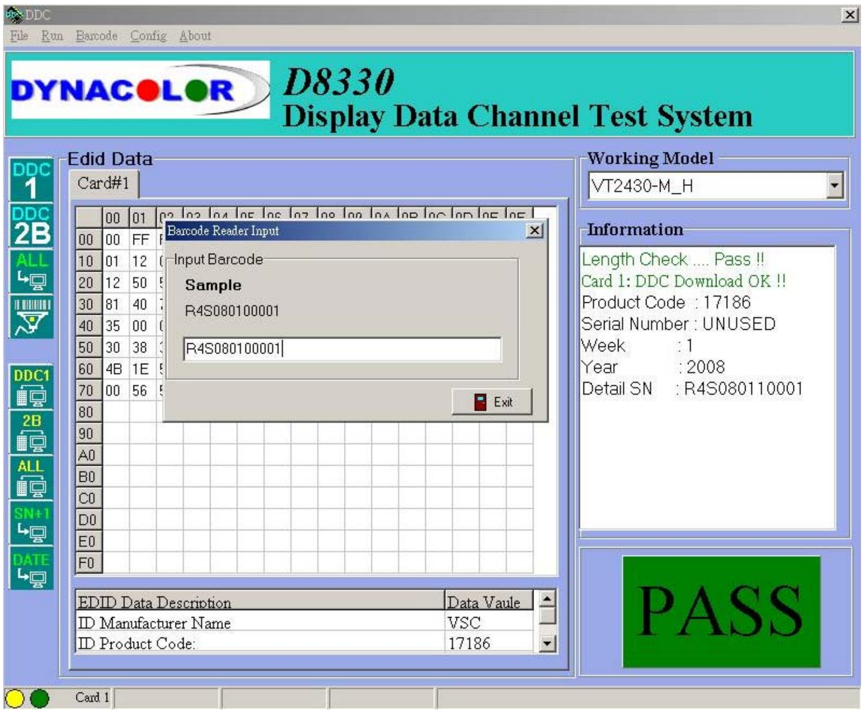
3. Press “ENTER” key.



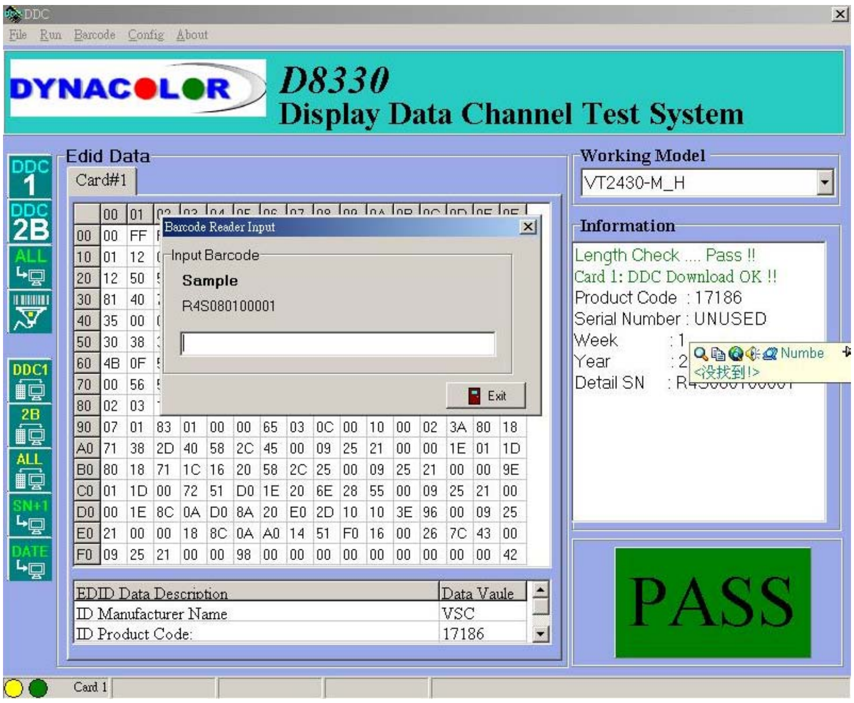
4. Press “F4” key.



5. Input bar code



6. Press “ENTER” key, then the successful picture is as follows. “DDC DOWNLOED OK!



7. Exit program

Packing For Shipping And Disassembly Procedure

Packing For Shipping

1. Packing Procedure

1.1 Paste protection film to protect the LCD TV. (Figure 1)

1.2 Put the LCD TV in the PE bag and seal the bag. (Figure 2)



Figure 1

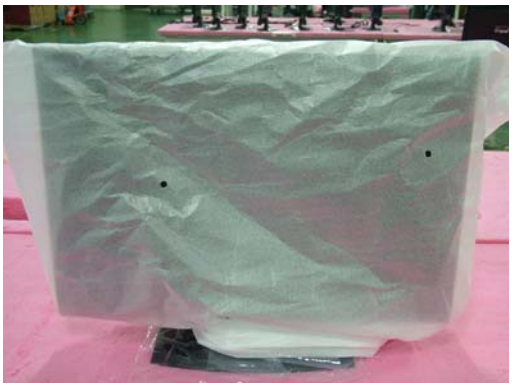


Figure 2

1.3 Put the cushions on the LCD TV. (Figure 3)

1.4 Place the LCD TV into the carton and put all the accessories into the carton. At last, close the carton and seal it with tape. (Figure 4)



Figure 3

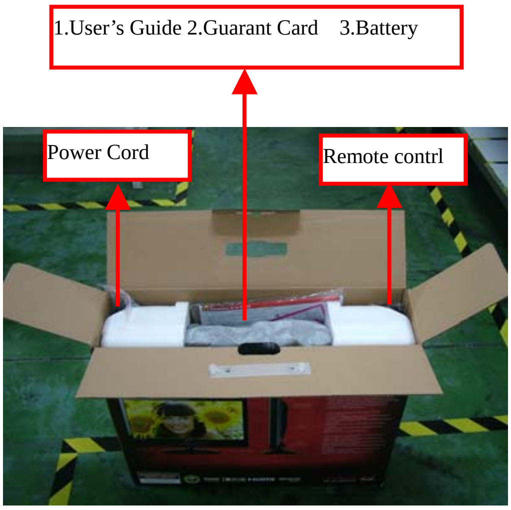
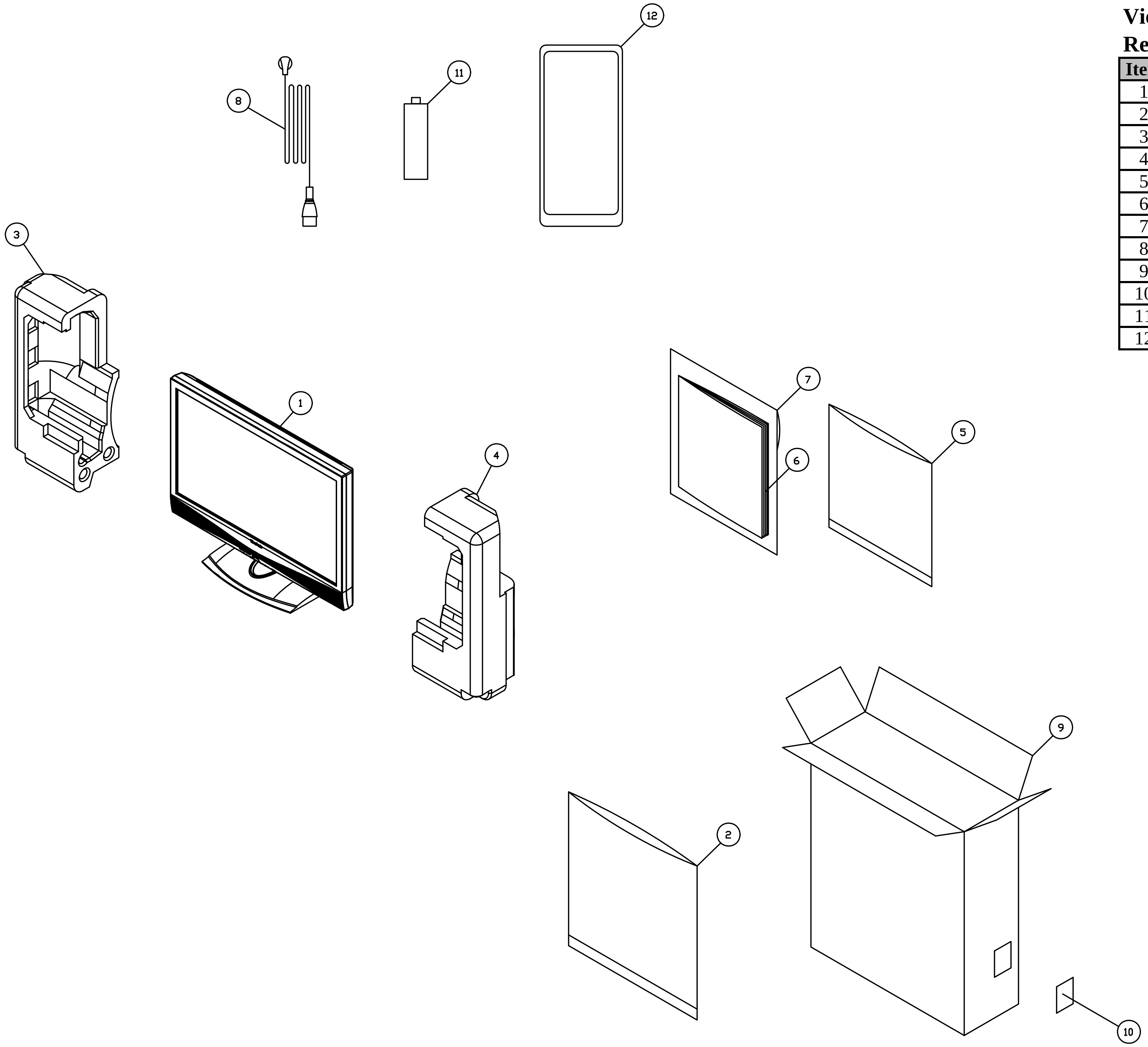


Figure 4

Packing for Shipping



PACKING PART LIST (VTMS2431)

ViewSonic Model Number: VS12335-2M

Rev:1a

Item	ViewSonic P/N	Ref. P/N	Description	Q'ty
1			VTMS2431M monitor	1
2	P-00009381	2013054075P	POLYETHY BAG	1
3	P-00009323	2012114500P	POLYFOAM(R)	1
4	NA	2012154600P	POLYFOAM(L)	1
5	P-00008947	2013222536P	POLYETHY BAG	1
6	NA	2001132017P	CD-OWNER GUIDE	1
7	DC-00009541	2002310807P	GUARANT CARD	1
8	A-00005362	2427130046P	AC POWER CORD	1
9	P-00009475	2011124004P	CARTON BOX	1
10	NA	2055632340P	LABEL	1
11	NA	2005100401P	BATTERY,DRY	2
12	A-00008456	2419200224P	REMOTE CONTROL	1

Disassembly Procedure

1. Disassembly of Stand from LCD TV.

1.1 Unscrew 4 screws to move Stand Unit and Dust Cover .







Dust Cover

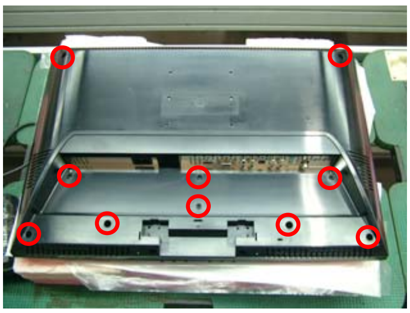




Stand

2. Disassembly of Rear Cover.

2.1 Unscrew 10 screws in the Rear Cover.



2.2 Prize the rectangle hole on Rear Cover (Fig.1) with a screwdriver(Fig.2) to make the Rear Cover detach from the LCD TV.

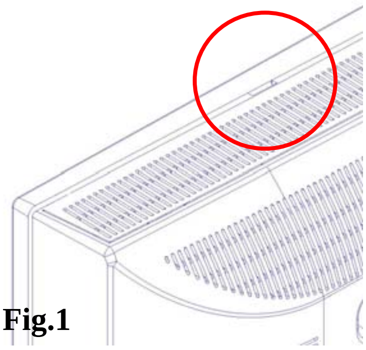
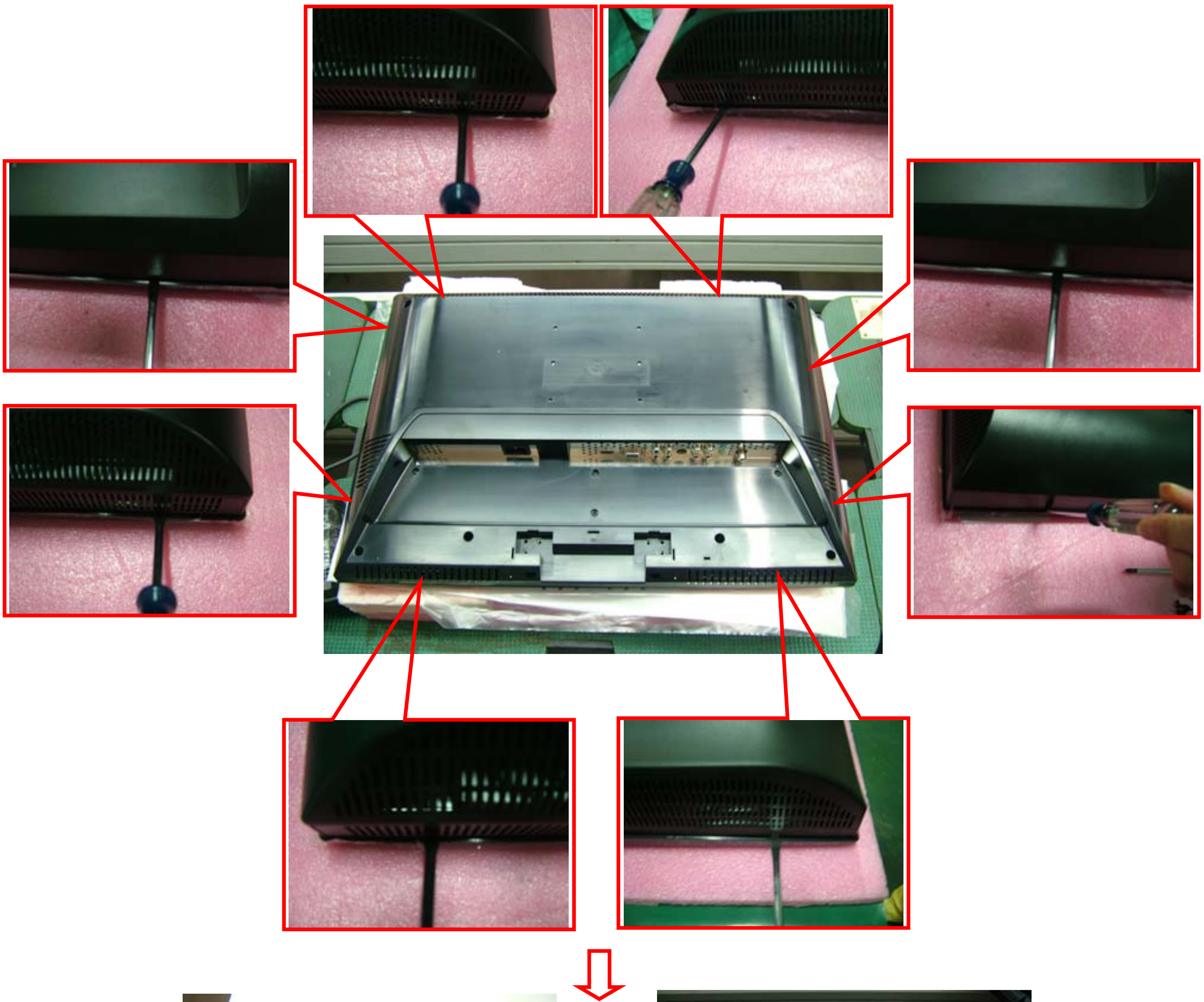

Fig.1


Fig.2



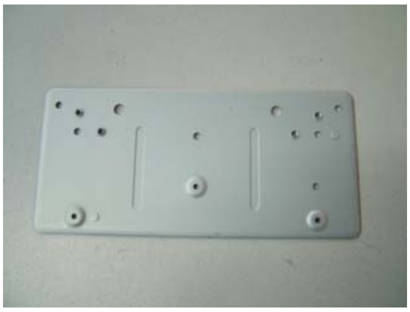

Rear Cover



3. Disassembly of Main Board, Power Board, Front Cover and Panel Unit.

3.1. Unscrew 8 screws to remove Bracket fix and Dust cover.





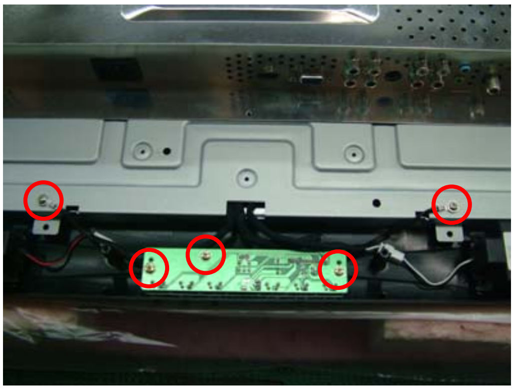
Bracket fix

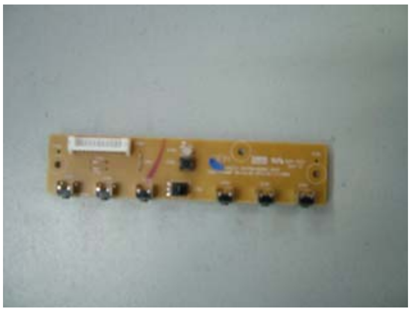




Dust cover.

3.2. Unscrew 5 screws to move KeyPad Board





KeyPad Board



3.3. Unscrew screws 5 to move Shield Plate .





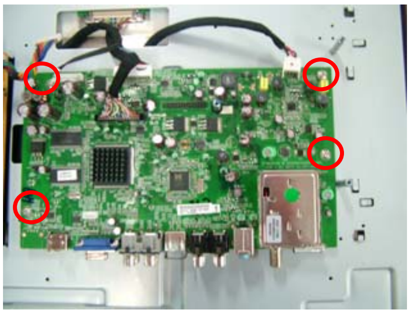
Shield Plate

3.4. Unscrew 7 screws and disconnect the wires to remove Mms Board and Main Board.



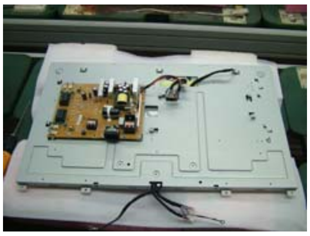


Mms Board

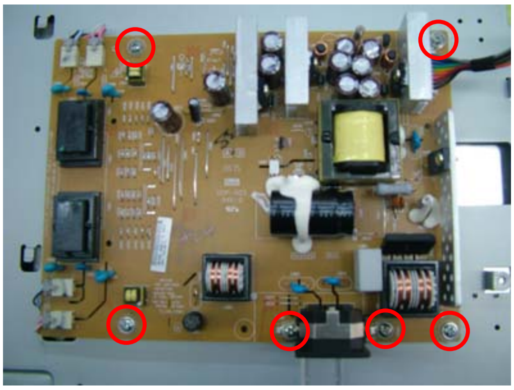




Main Board

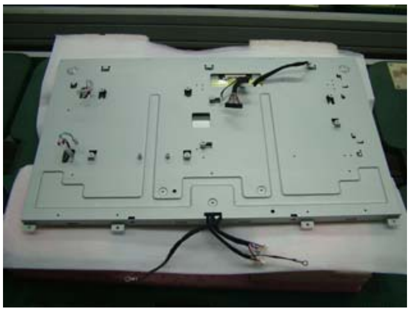


3.5. Unscrew 4 screws and disconnect the wires to remove Power Board.

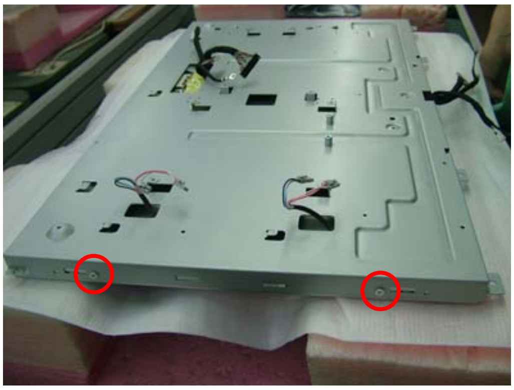




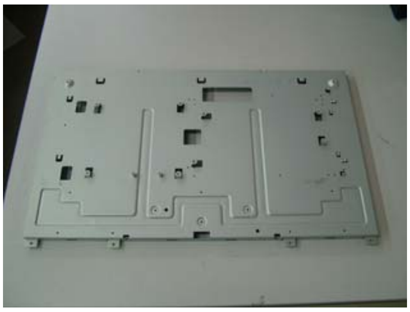
Power Board



3.6. Unscrew screws 4 to move Panel Bracket .



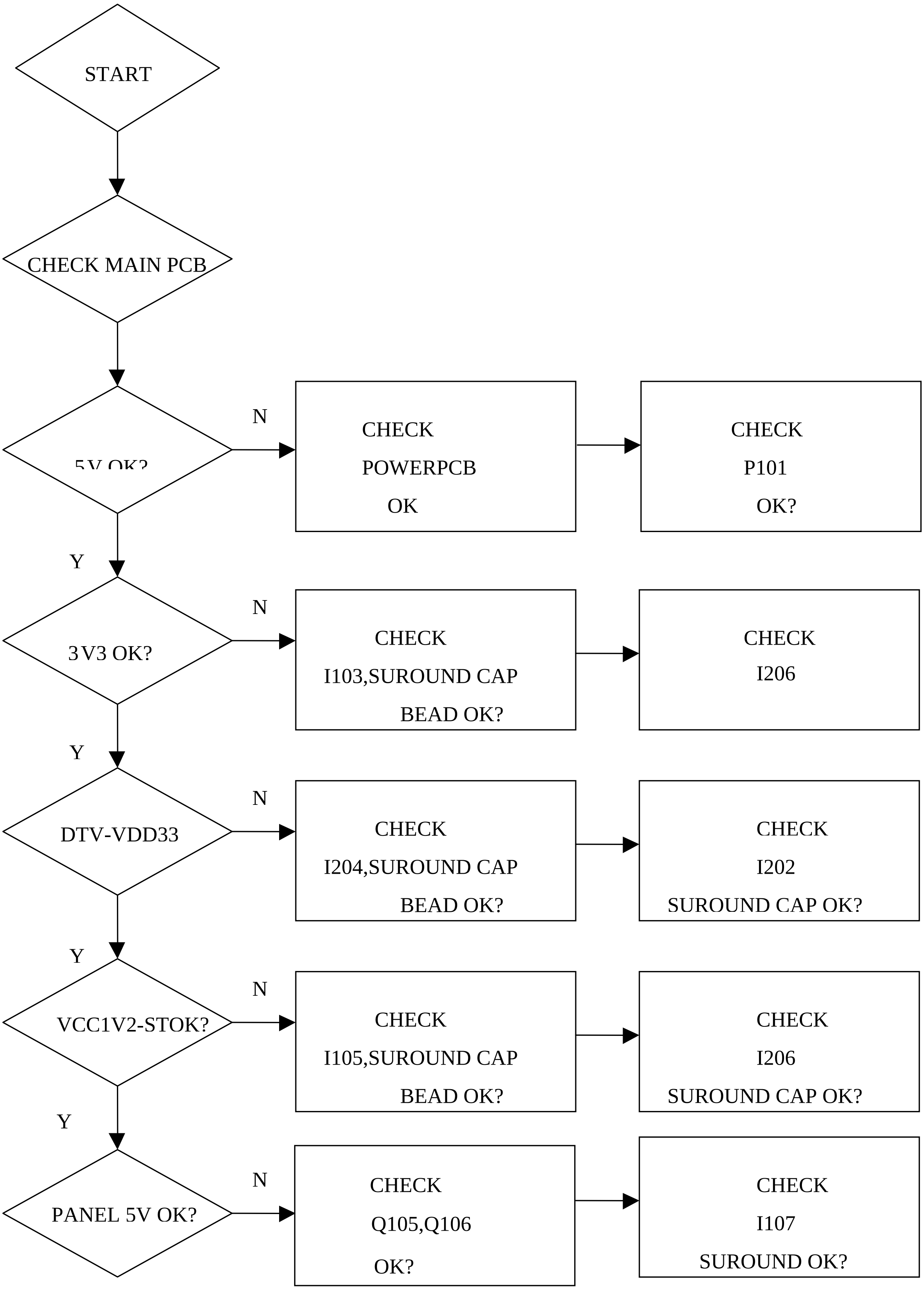




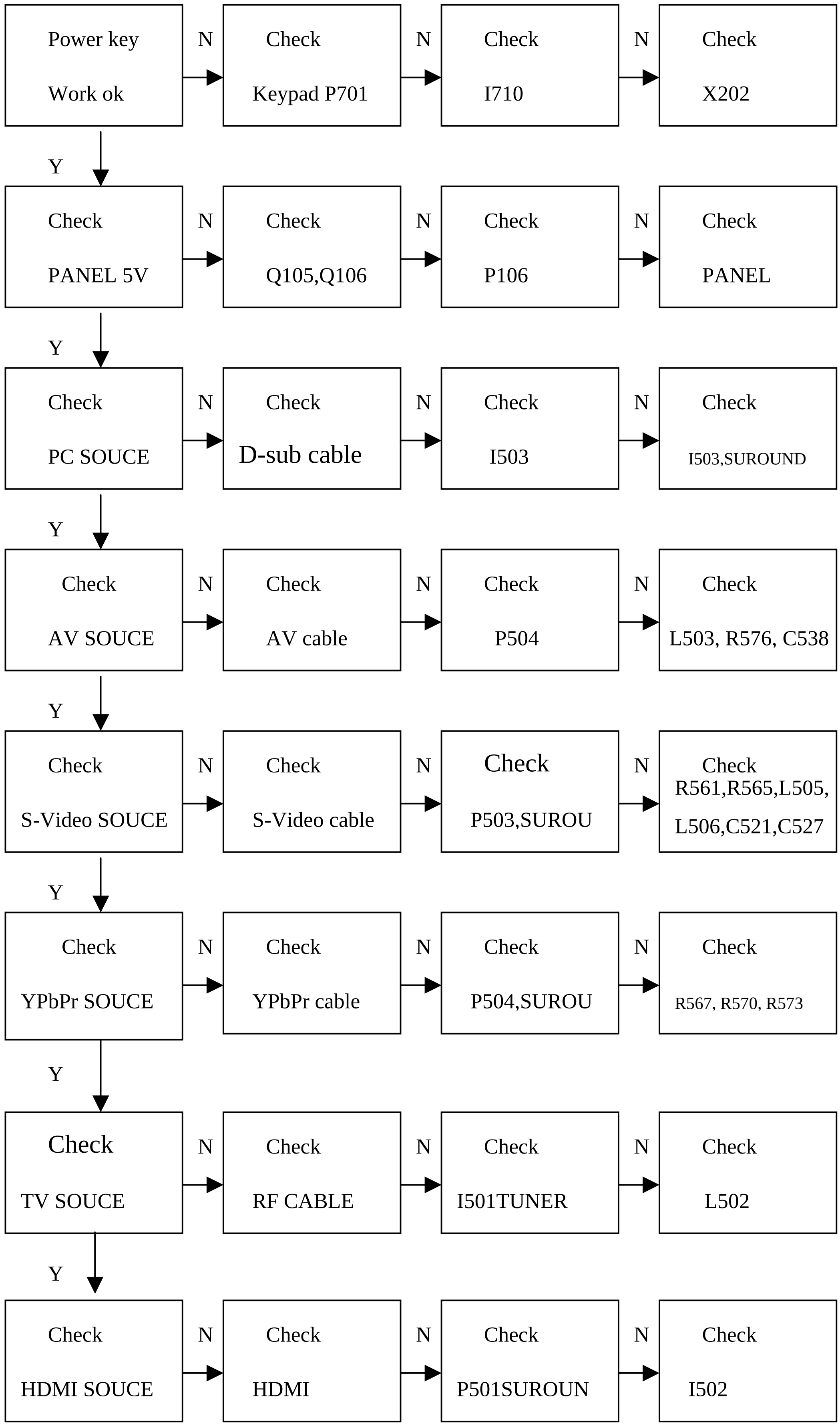


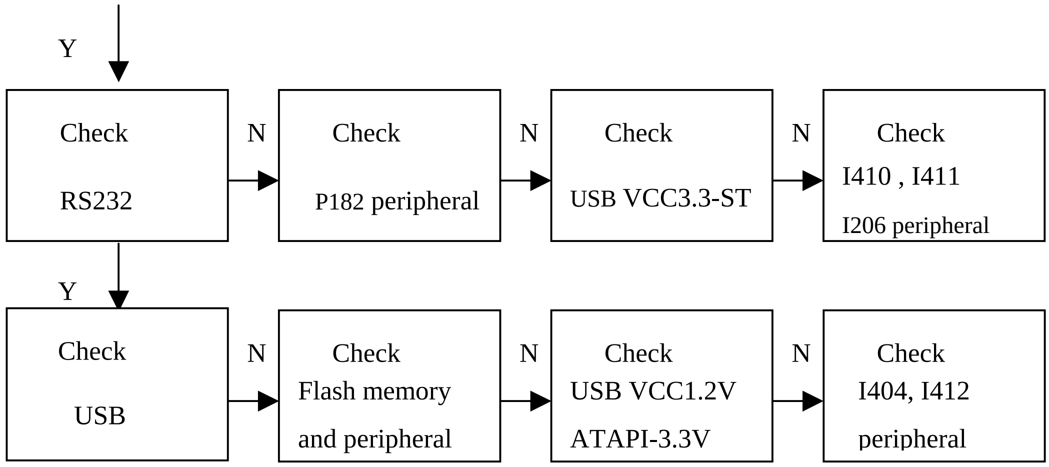
Panel Bracket

6. Trouble Shooting Flow Chart

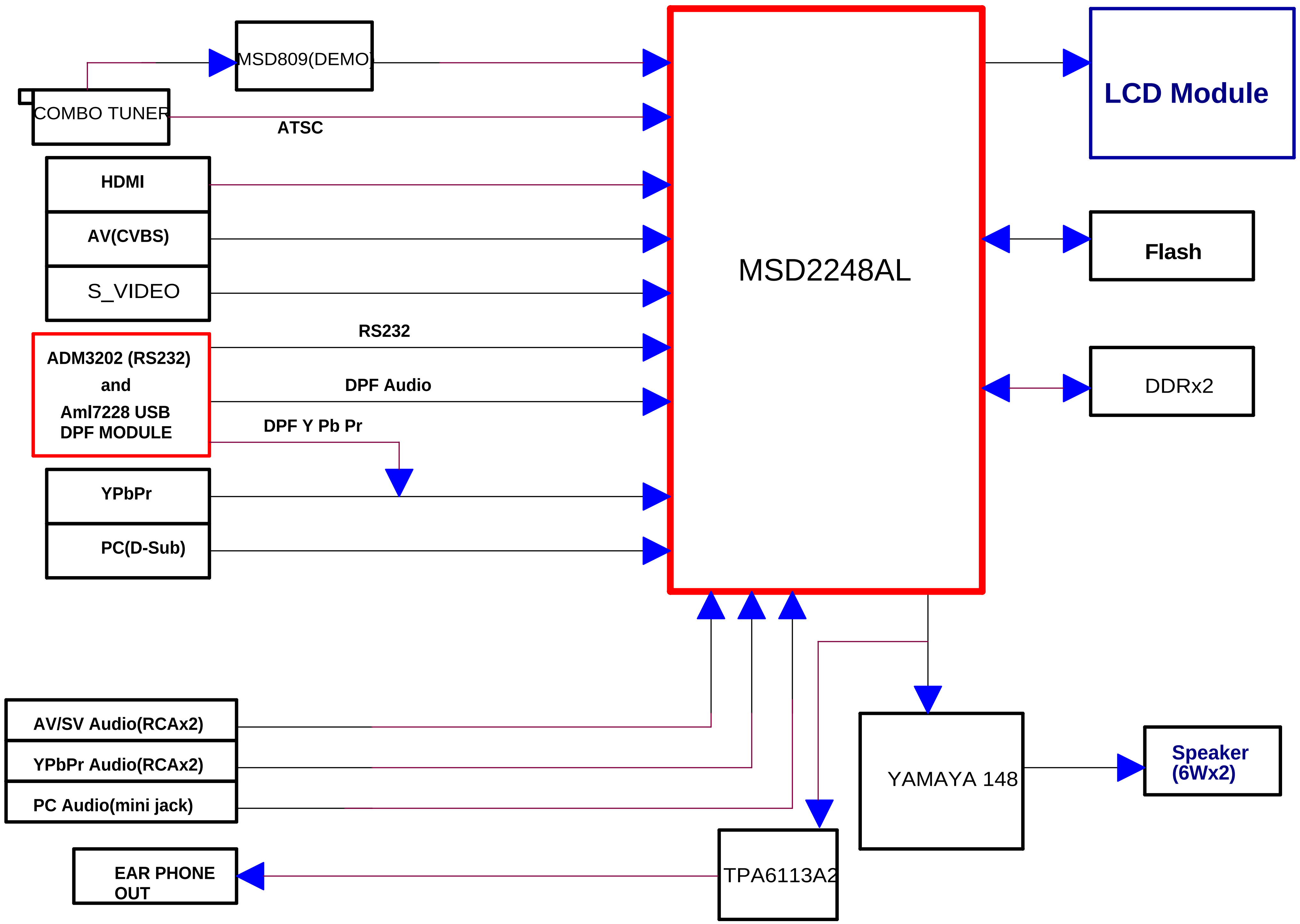


6.1 NO DISPLAY



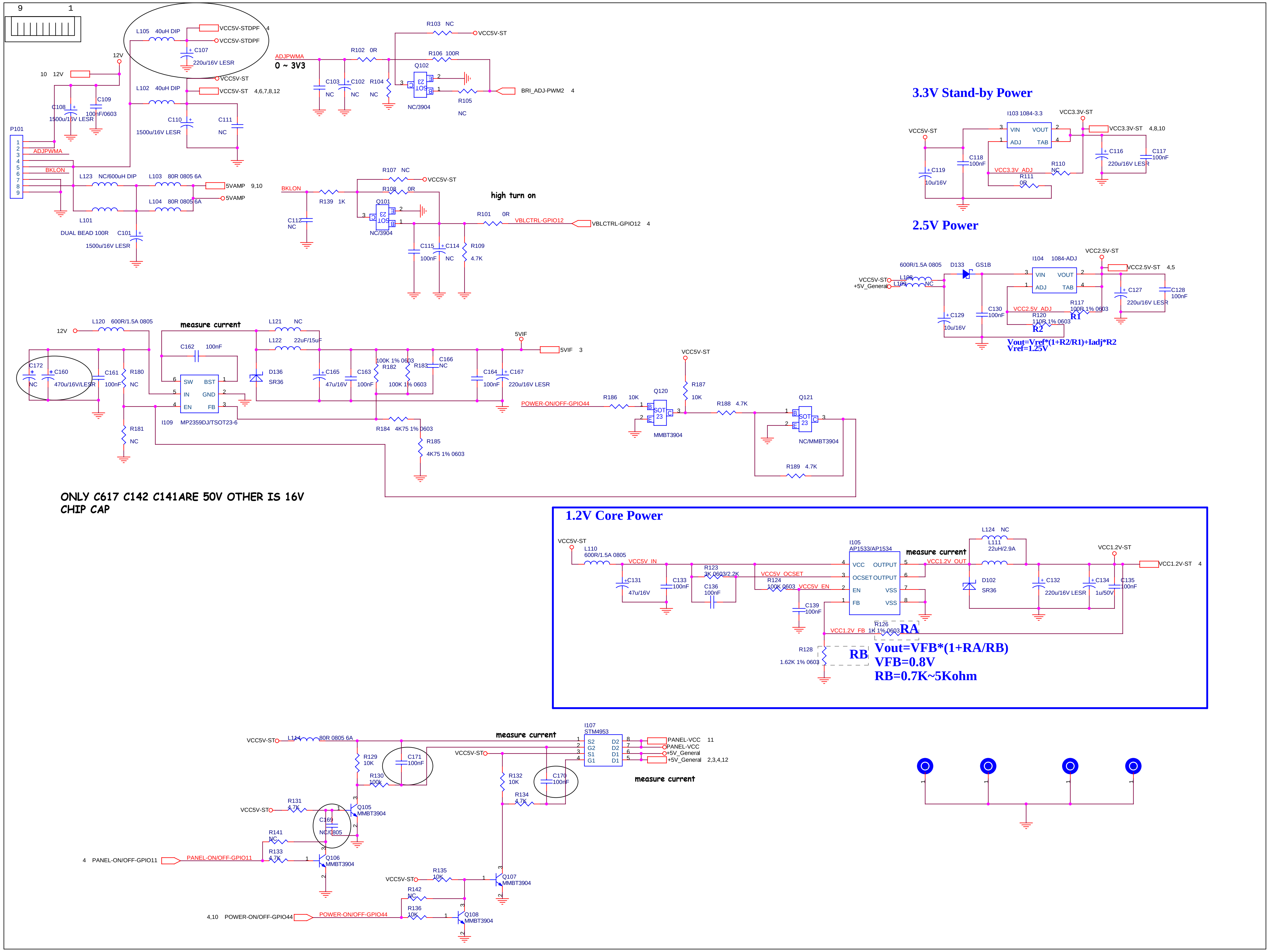

Y
Check
RS232
N
Check
P182 peripheral
N
Check
USB VCC3.3-ST
N
Check
I410 , I411
I206 peripheral
Y
Check
USB
N
Check
Flash memory
and peripheral
N
Check
USB VCC1.2V
ATAPI-3.3V
N
Check
I404, I412
peripheral

7. Block Diagram

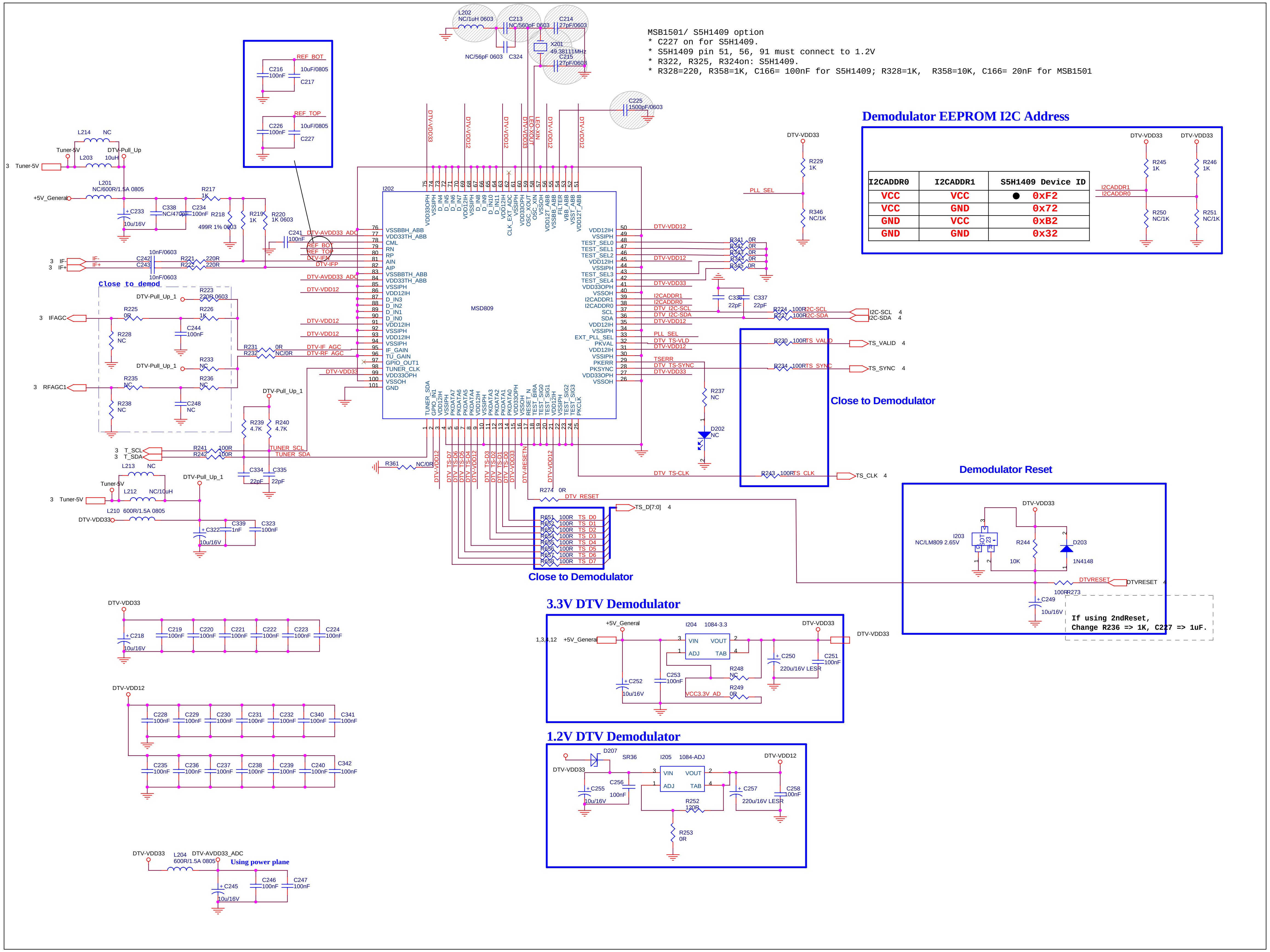


8. Schematic Diagrams

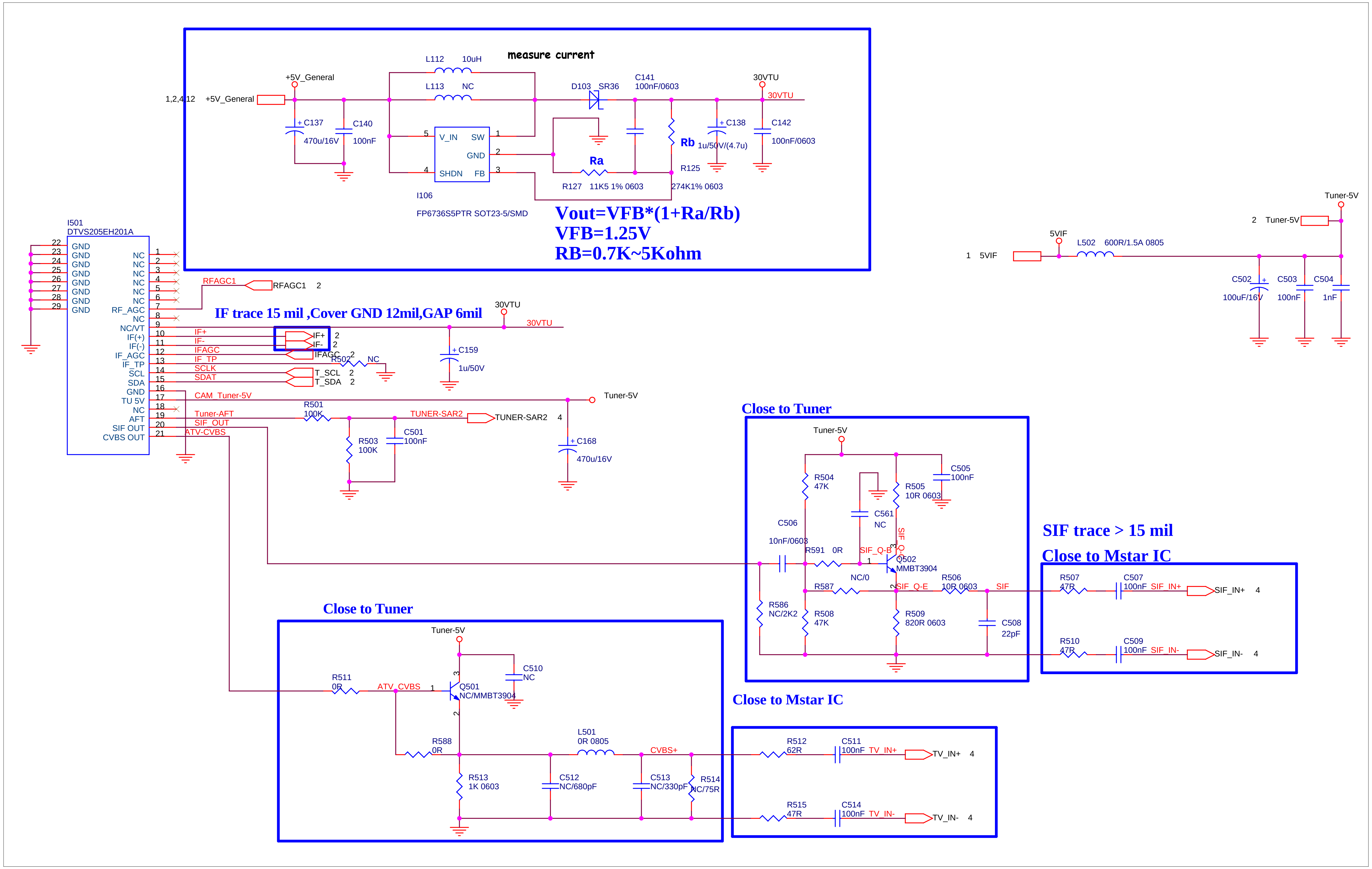
8.1. System Power



8.2. DTV-MSD809

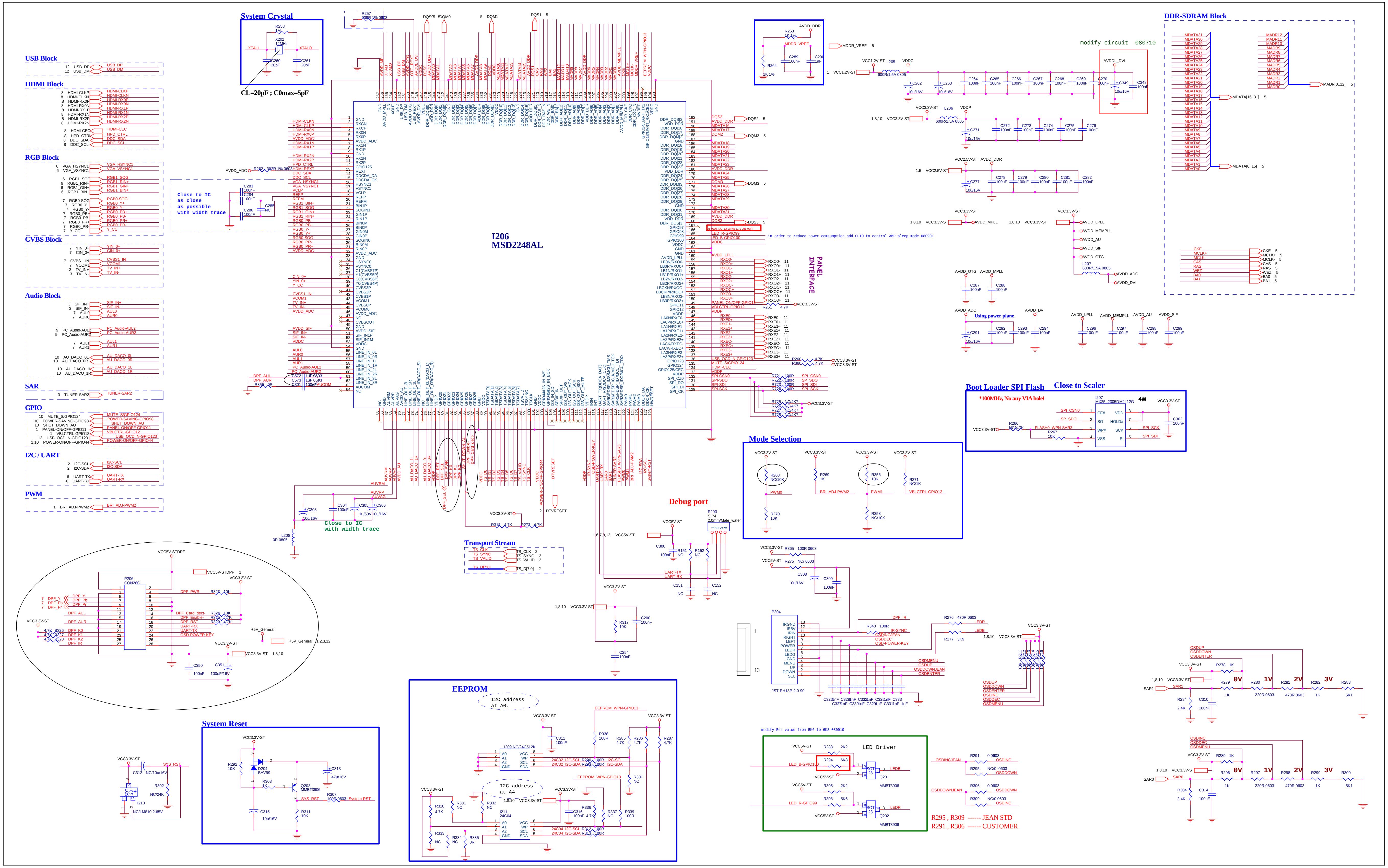


8.3. CAM Tuner

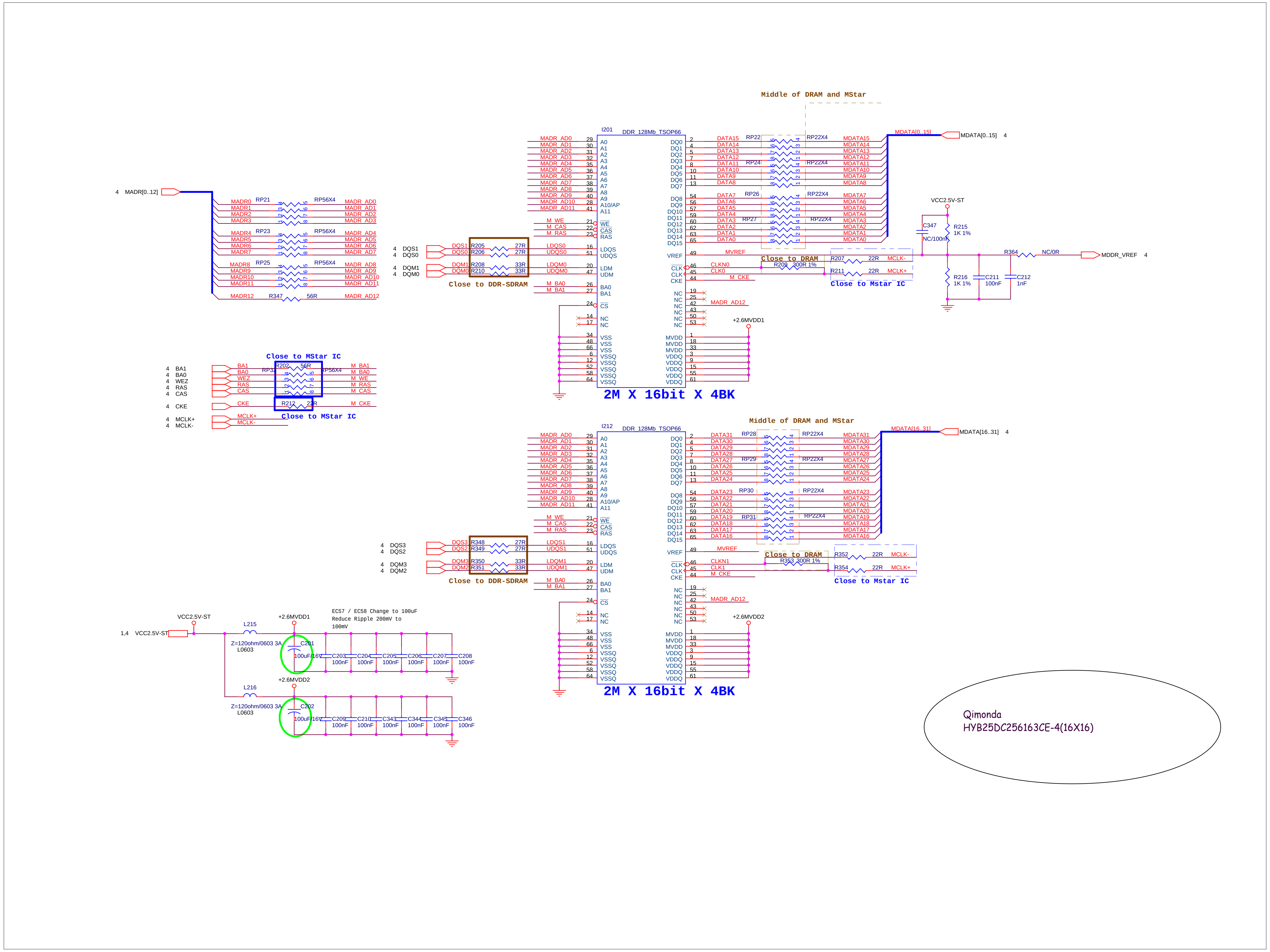


measure current
L112 10uH
L113 NC
+5V_General
1,2,4 12 +5V_General
C137 470u/16V
C140 100nF
V_IN SW GND SHDN FB
I106
FP6736S5PTR SOT23-5/SMD
D103 SR36
C141 100nF/0603
30VTU
C138 1u/50V/(4.7u)
C142 100nF/0603
Ra
Rb
R127 11K5 1% 0603
R125 274K1% 0603
Vout=VFB*(1+Ra/Rb)
VFB=1.25V
RB=0.7K~5Kohm
I501
DTVS205EH201A
RFAGC1
IF trace 15 mil ,Cover GND 12mil,GAP 6mil
IF+
IF-
IFAGC
IF_TP
SCLK
SDAT
T_SCL
T_SDA
R502 NC
C159 1u/50V
CAM_Tuner-5V
Tuner-5V
Tuner-AFT
SIF_OUT
ATV-CVBS
R501 100K
R503 100K
C501 100nF
TUNER-SAR2
C168 470u/16V
5VIF
L502 600R/1.5A 0805
C502 100uF/16V
C503 100nF
C504 1nF
Close to Tuner
R504 47K
R505 10R 0603
C505 100nF
C561 NC
C506 10nF/0603
R591 0R
SIF_Q-B
Q502 MMBT3904
R587 NC/0
SIF_Q-E
R506 10R 0603
SIF
R586 NC/2K2
R508 47K
R509 820R 0603
C508 22pF
SIF trace > 15 mil
Close to Mstar IC
R507 47R
C507 100nF
SIF_IN+
R510 47R
C509 100nF
SIF_IN-
Close to Tuner
R511 0R
ATV_CVBS
Q501 NC/MMBT3904
C510 NC
R588 0R
L501 0R 0805
CVBS+
R513 1K 0603
C512 NC/680pF
C513 NC/330pF
R514 NC/75R
Close to Mstar IC
R512 62R
C511 100nF
TV_IN+
R515 47R
C514 100nF
TV_IN-

8.4. MSD2248AL_256_IC

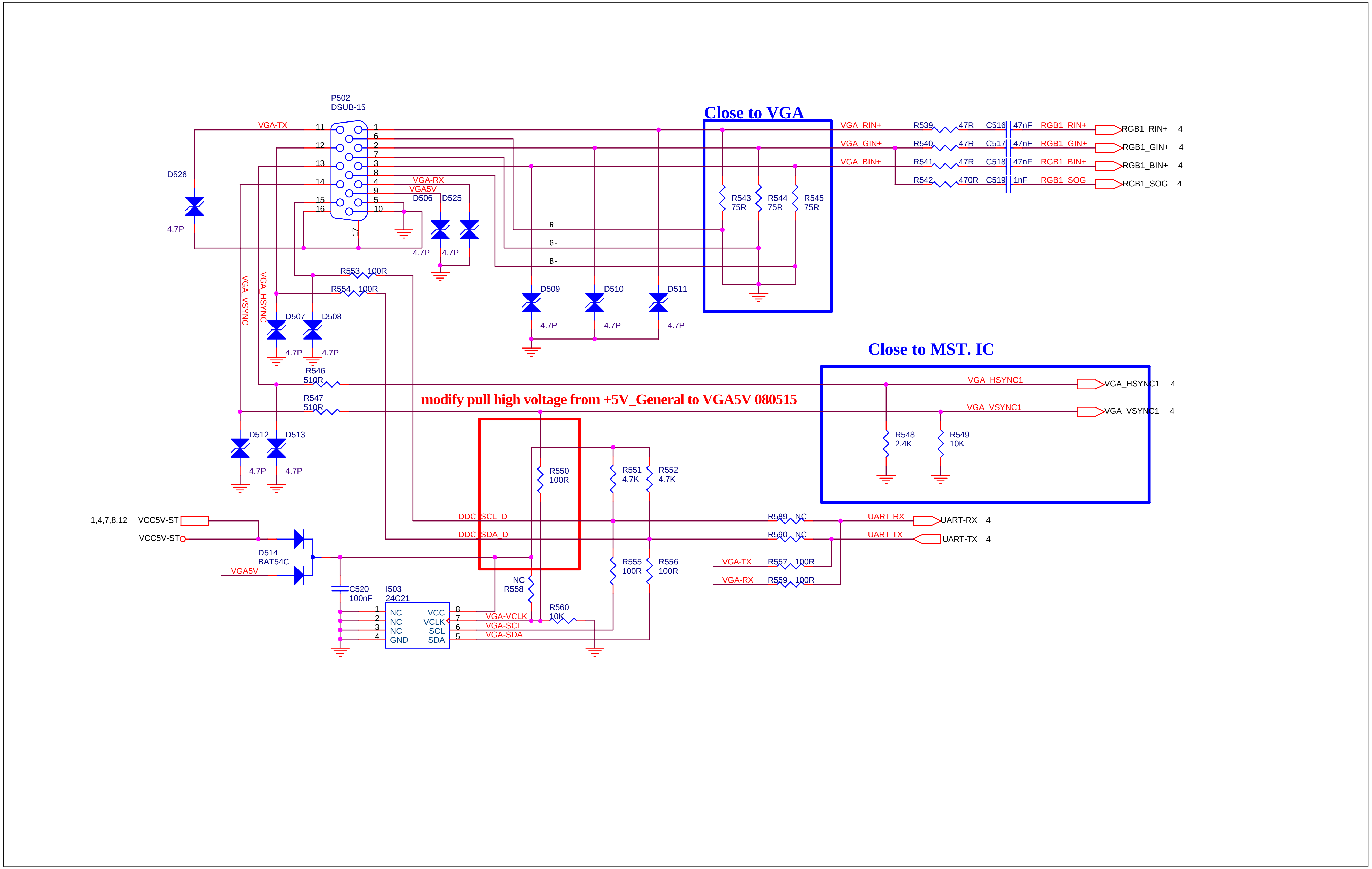


8.5. DDR1



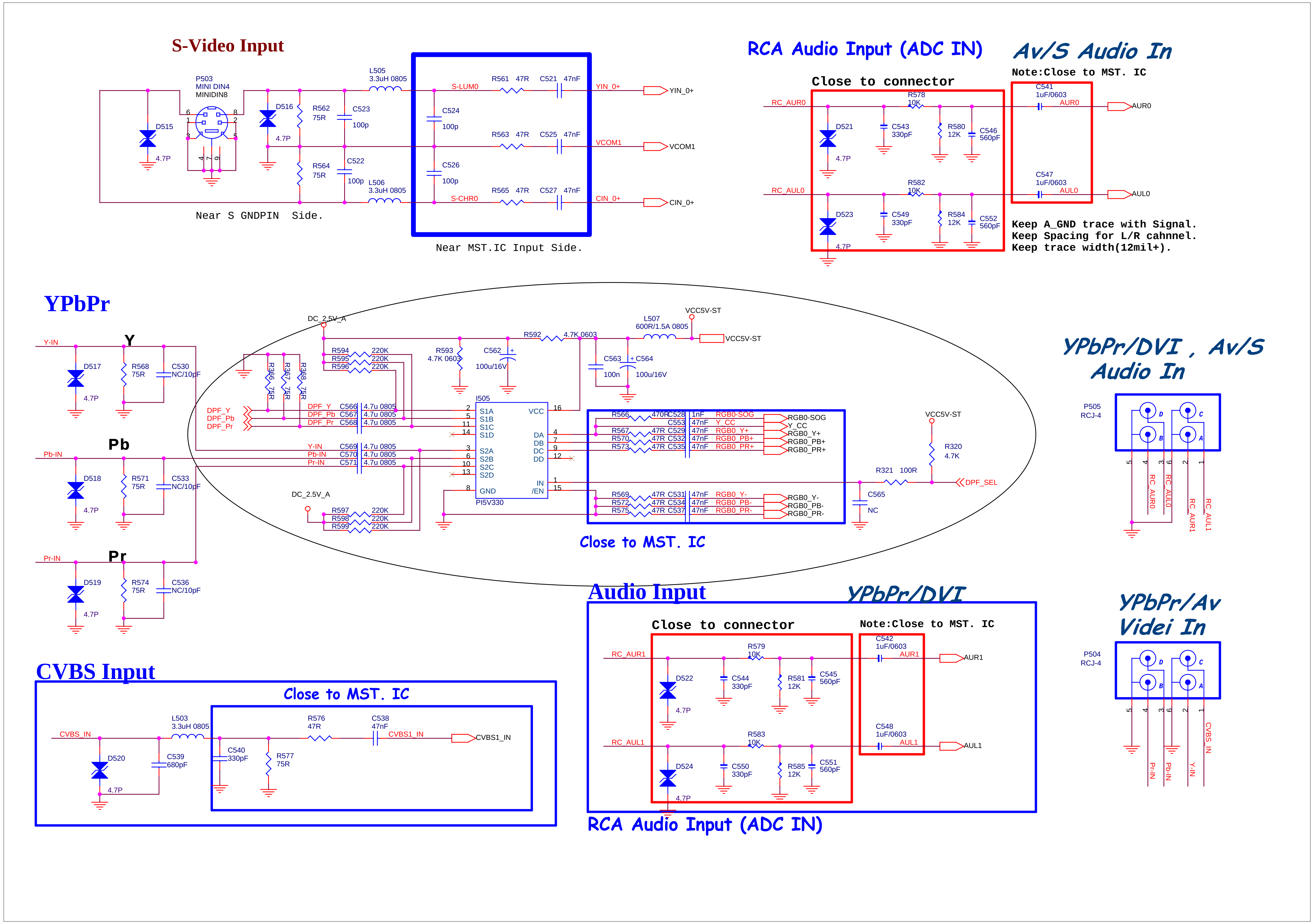
Middle of DRAM and MStar
DDR_128Mb_TSOP66
2M X 16bit X 4BK
Close to DDR-SDRAM
Close to MStar IC
Close to DRAM
Qimonda
HYB25DC256163CE-4(16X16)

8.6. VGA

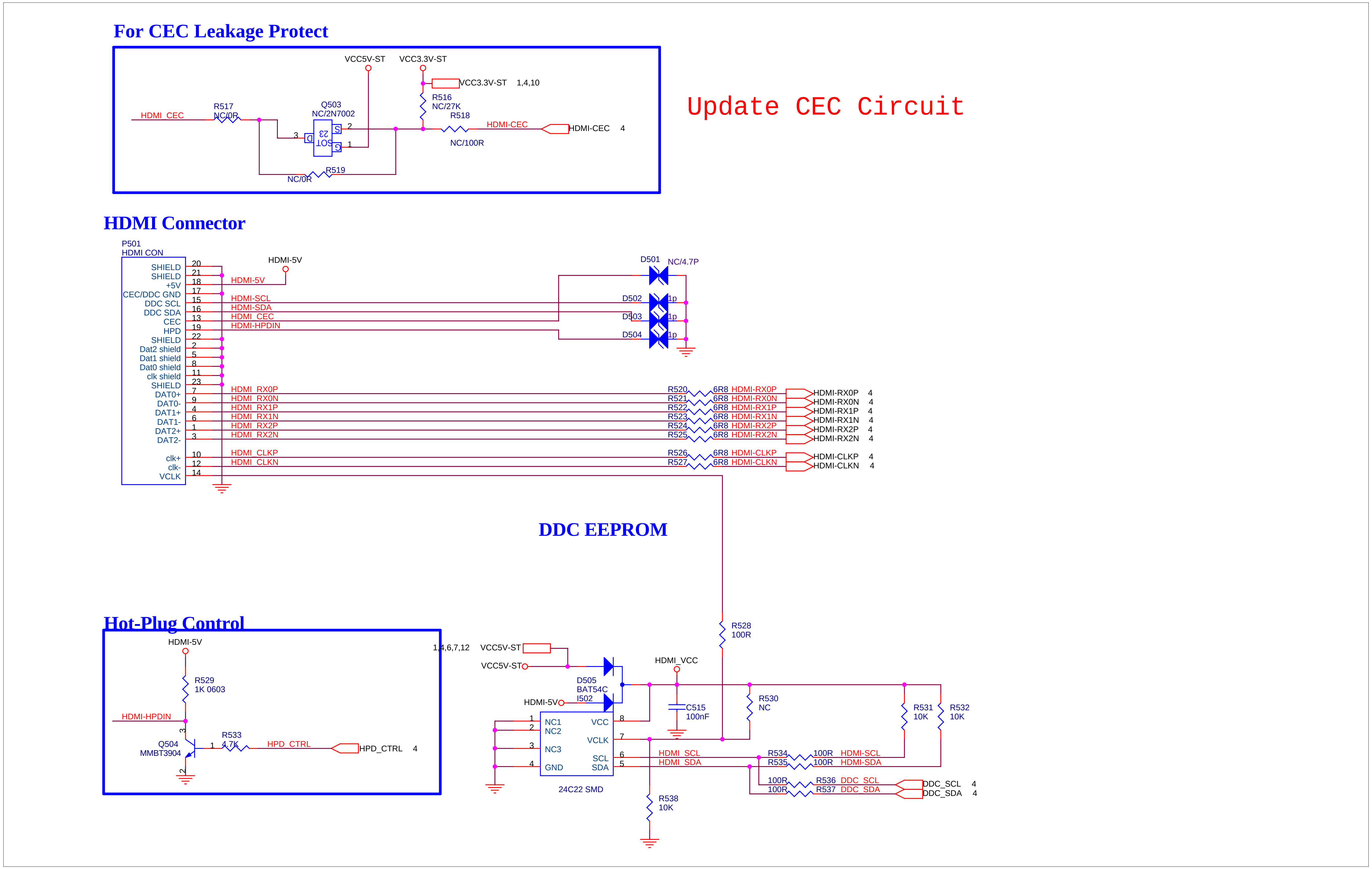


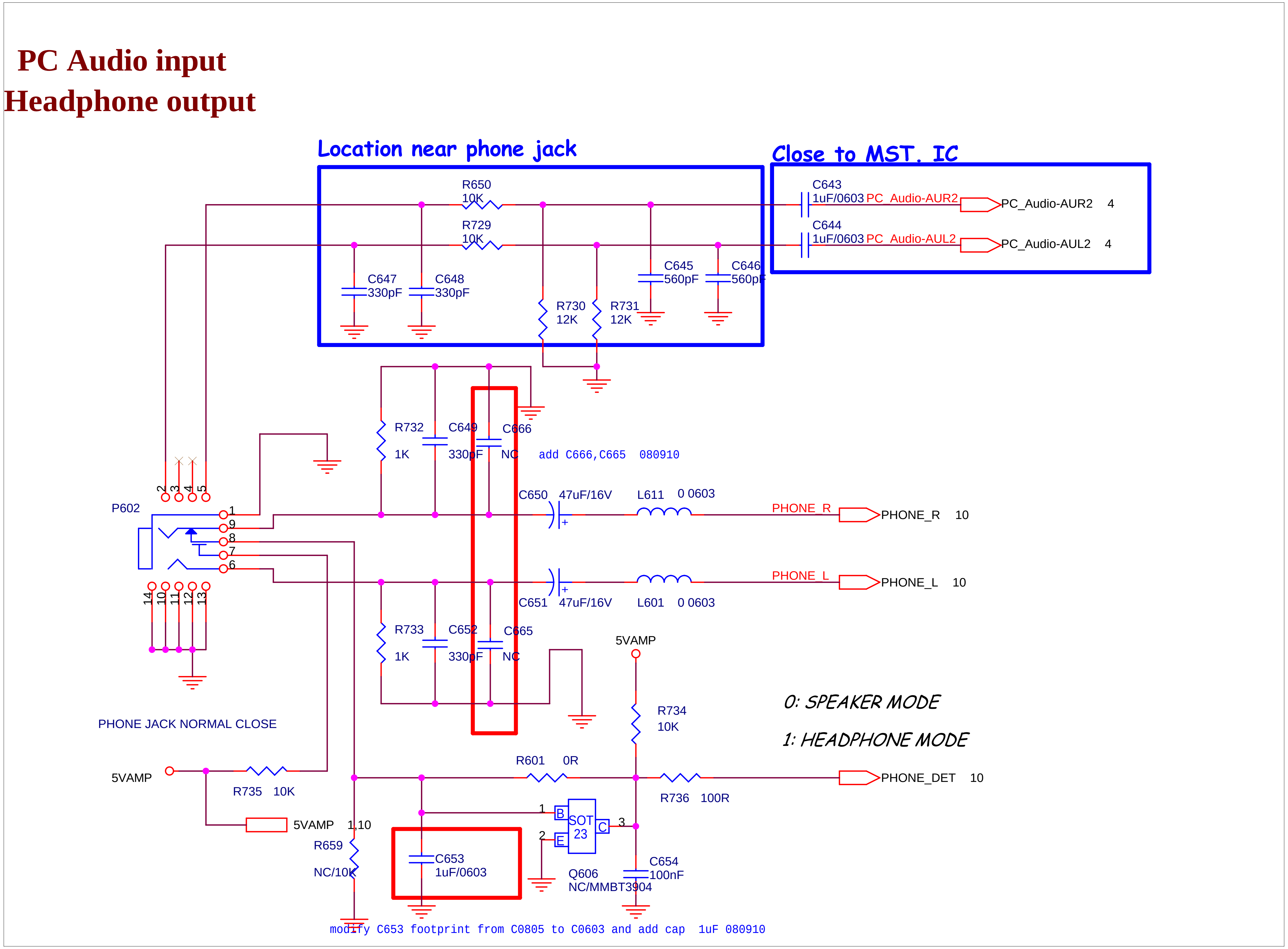
P502
DSUB-15
Close to VGA
Close to MST. IC
modify pull high voltage from +5V_General to VGA5V 080515
VGA-TX
VGA-RX
VGA5V
VGA_RIN+
VGA_GIN+
VGA_BIN+
RGB1_RIN+
RGB1_GIN+
RGB1_BIN+
RGB1_SOG
VGA_HSYNC1
VGA_VSYNC1
DDC_SCL_D
DDC_SDA_D
UART-RX
UART-TX
VCC5V-ST
I503
24C21
VGA-VCLK
VGA-SCL
VGA-SDA
D514
BAT54C

8.7. Video_Interface

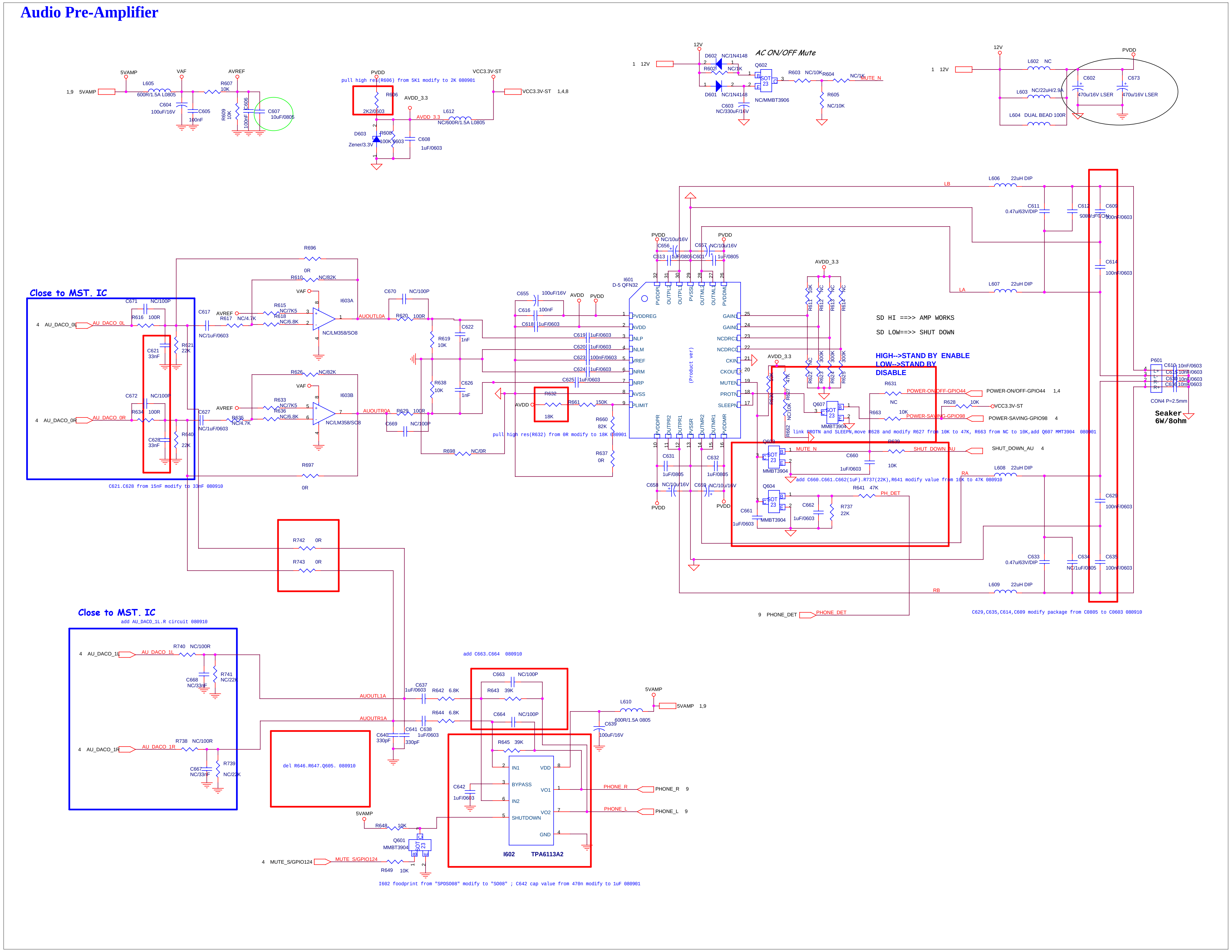


8.8. HDMI Interface

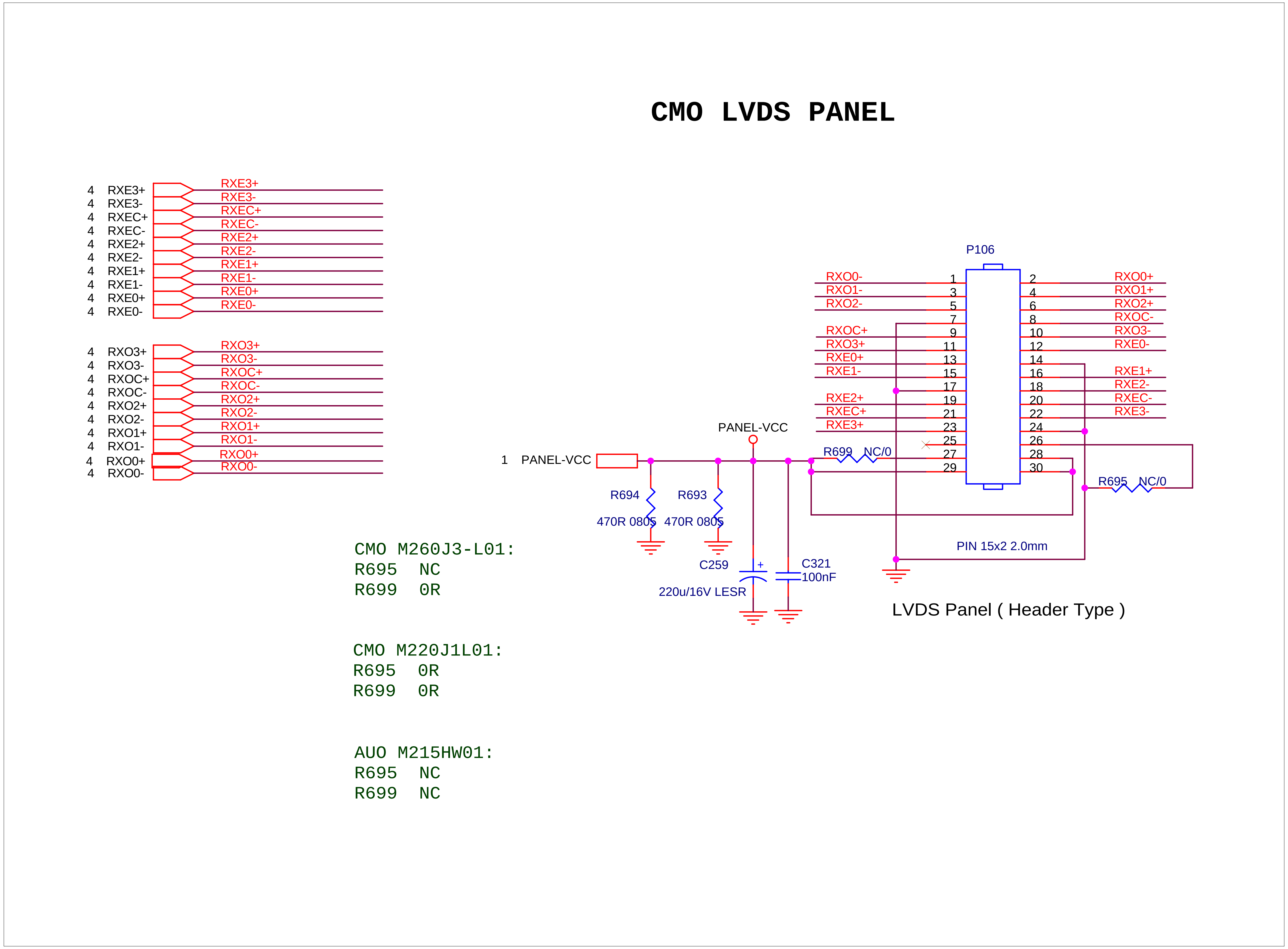



PC Audio input
Headphone output
Location near phone jack
Close to MST. IC
R650 10K
R729 10K
C643 1uF/0603 PC_Audio-AUR2
PC_Audio-AUR2 4
C644 1uF/0603 PC_Audio-AUL2
PC_Audio-AUL2 4
C647 330pF
C648 330pF
C645 560pF
C646 560pF
R730 12K
R731 12K
R732 1K
C649 330pF
C666 NC
add C666,C665 080910
P602
C650 47uF/16V
L611 0 0603
PHONE_R
PHONE_R 10
PHONE_L
PHONE_L 10
C651 47uF/16V
L601 0 0603
R733 1K
C652 330pF
C665 NC
5VAMP
R734 10K
0: SPEAKER MODE
1: HEADPHONE MODE
PHONE JACK NORMAL CLOSE
5VAMP
R735 10K
R601 0R
R736 100R
PHONE_DET 10
5VAMP 1,10
R659 NC/10K
C653 1uF/0603
SOT 23
Q606 NC/MMBT3904
C654 100nF
modify C653 footprint from C0805 to C0603 and add cap 1uF 080910

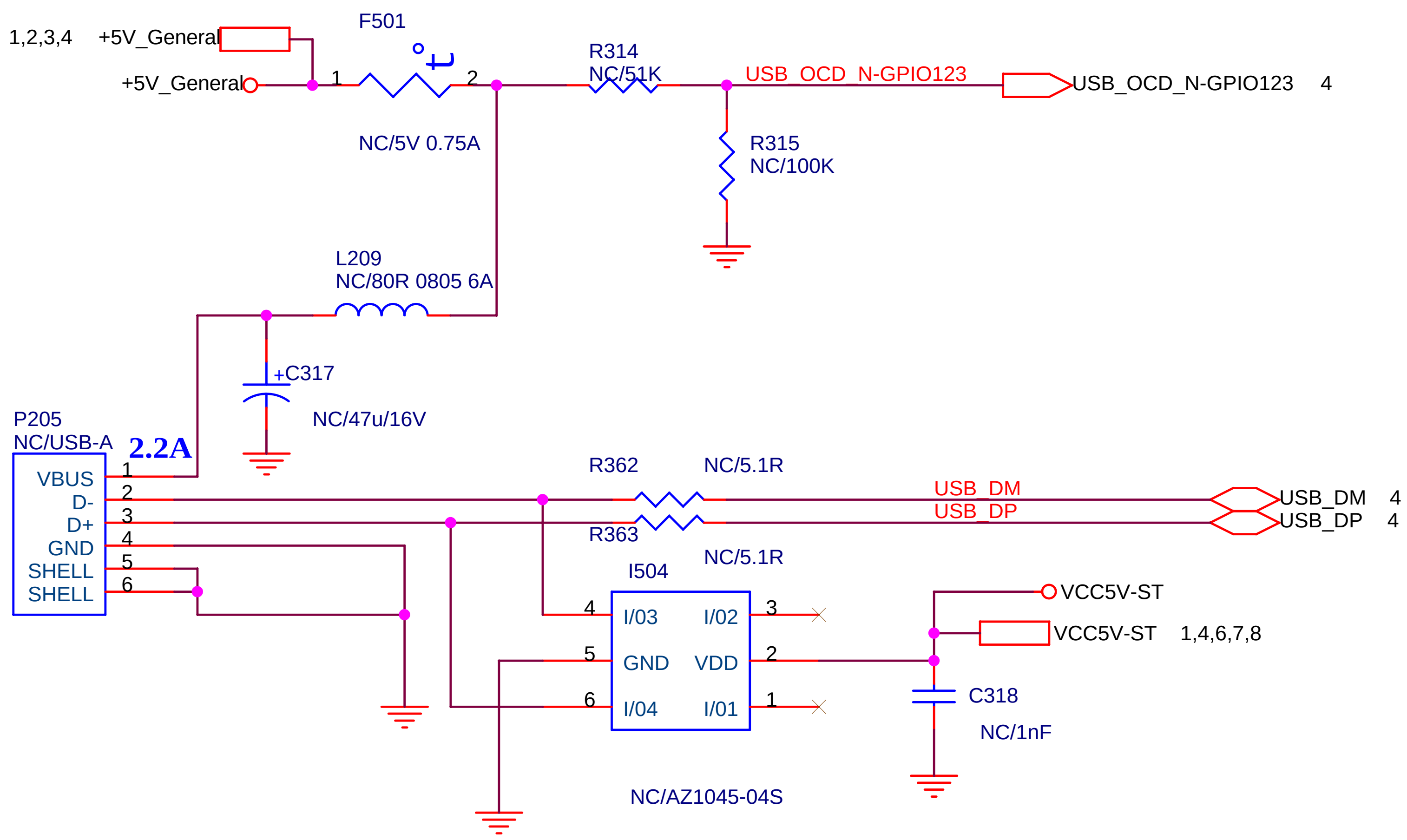
8.10. Audio Amp. Interface



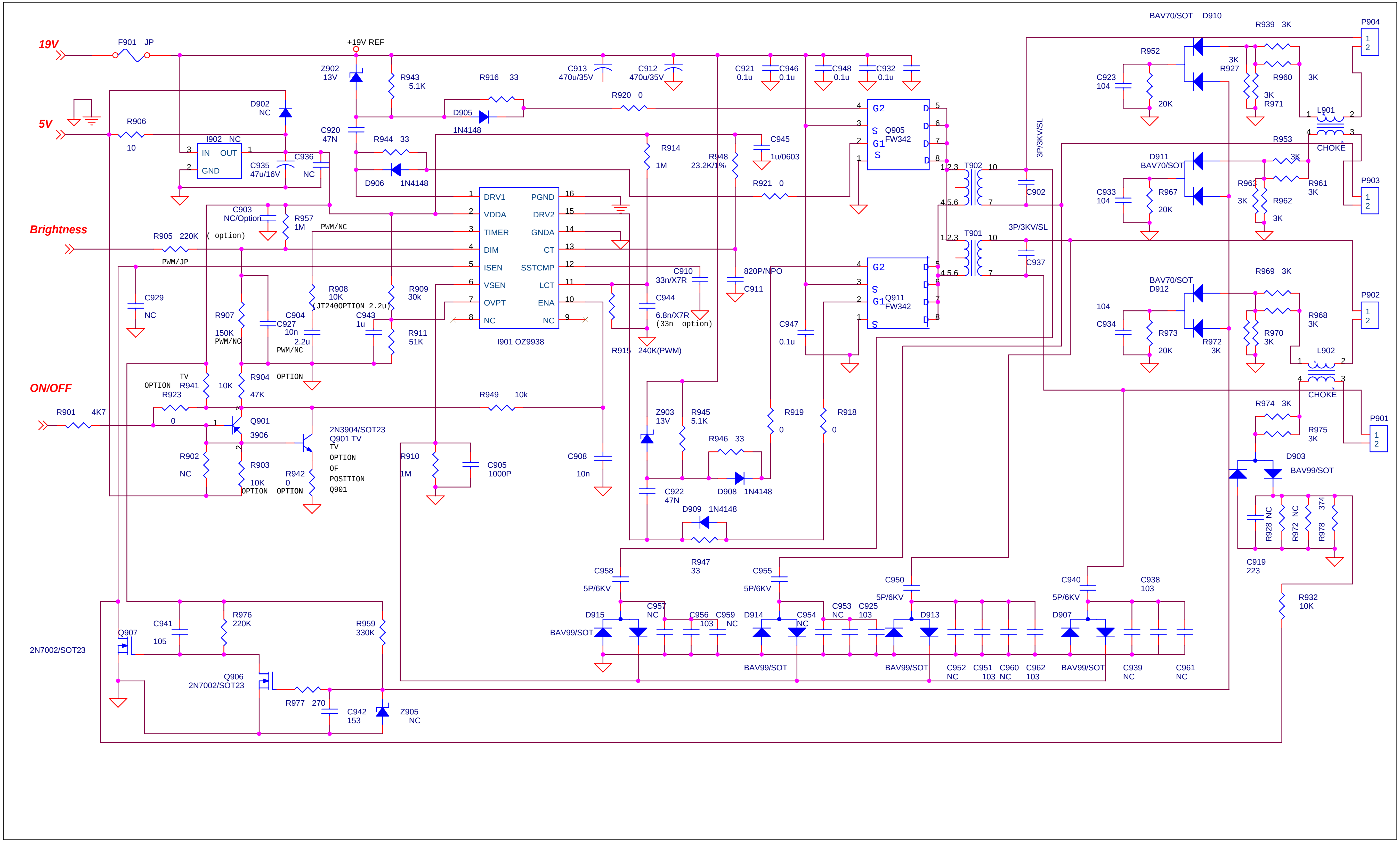
8.11. LVDSx2 Panel



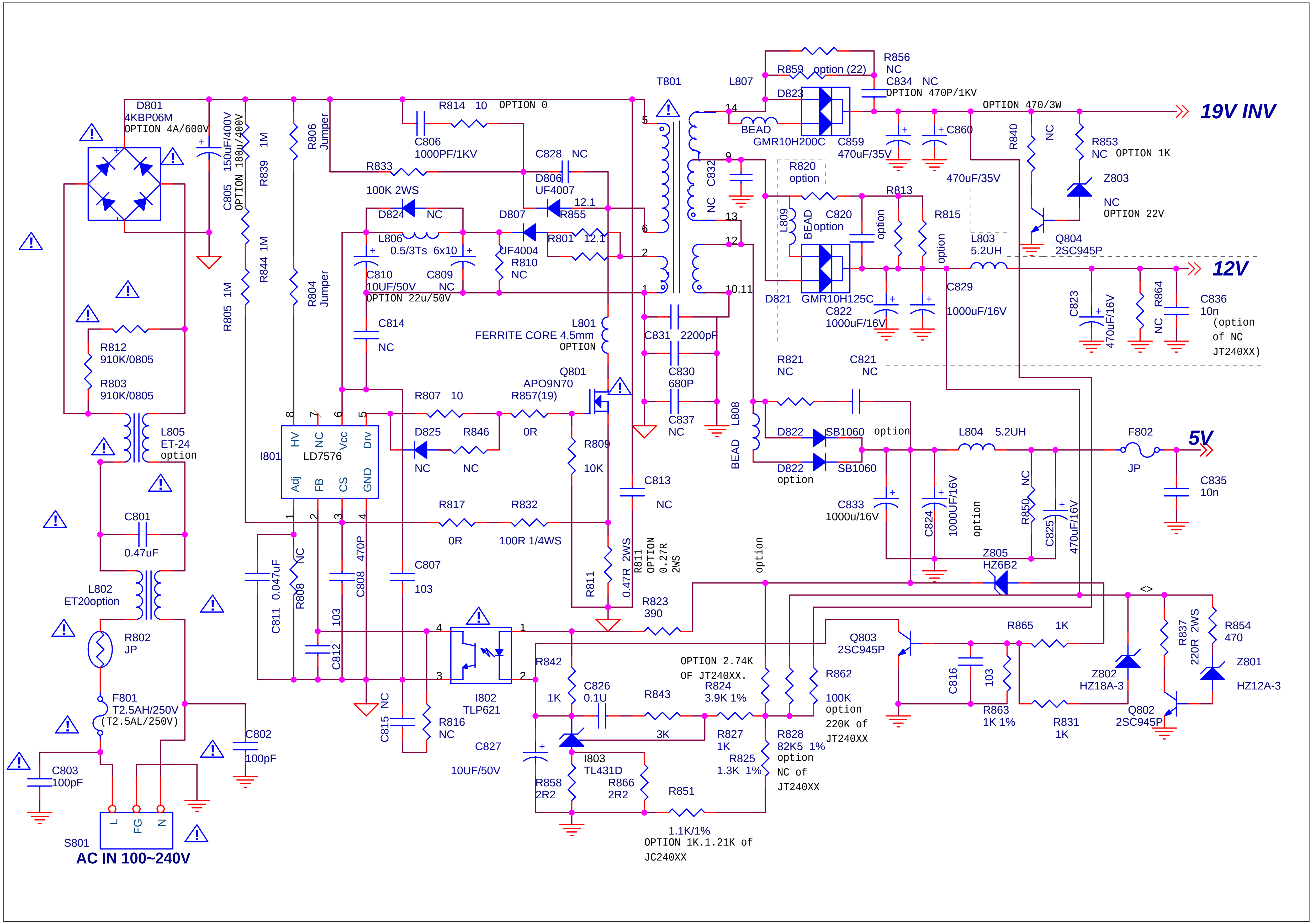
8.12. USB


1,2,3,4 +5V_General
+5V_General
F501
NC/5V 0.75A
R314
NC/51K
USB_OCD_N-GPIO123
USB_OCD_N-GPIO123 4
R315
NC/100K
L209
NC/80R 0805 6A
C317
NC/47u/16V
P205
NC/USB-A
2.2A
VBUS
D-
D+
GND
SHELL
SHELL
R362
NC/5.1R
R363
NC/5.1R
USB_DM
USB_DP
USB_DM 4
USB_DP 4
I504
I/03
I/02
GND
VDD
I/04
I/01
NC/AZ1045-04S
VCC5V-ST
VCC5V-ST 1,4,6,7,8
C318
NC/1nF

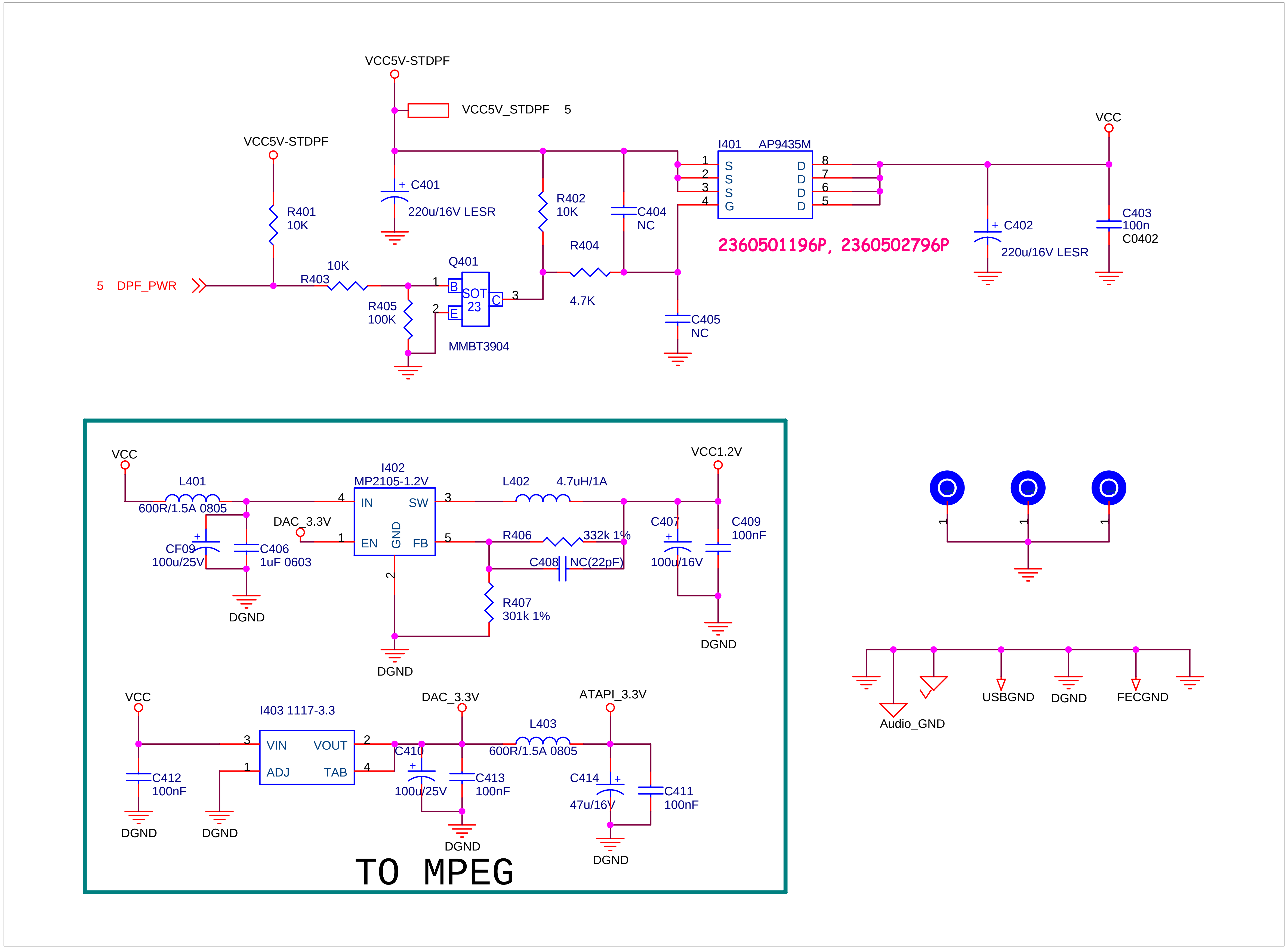
8.13. INVERT



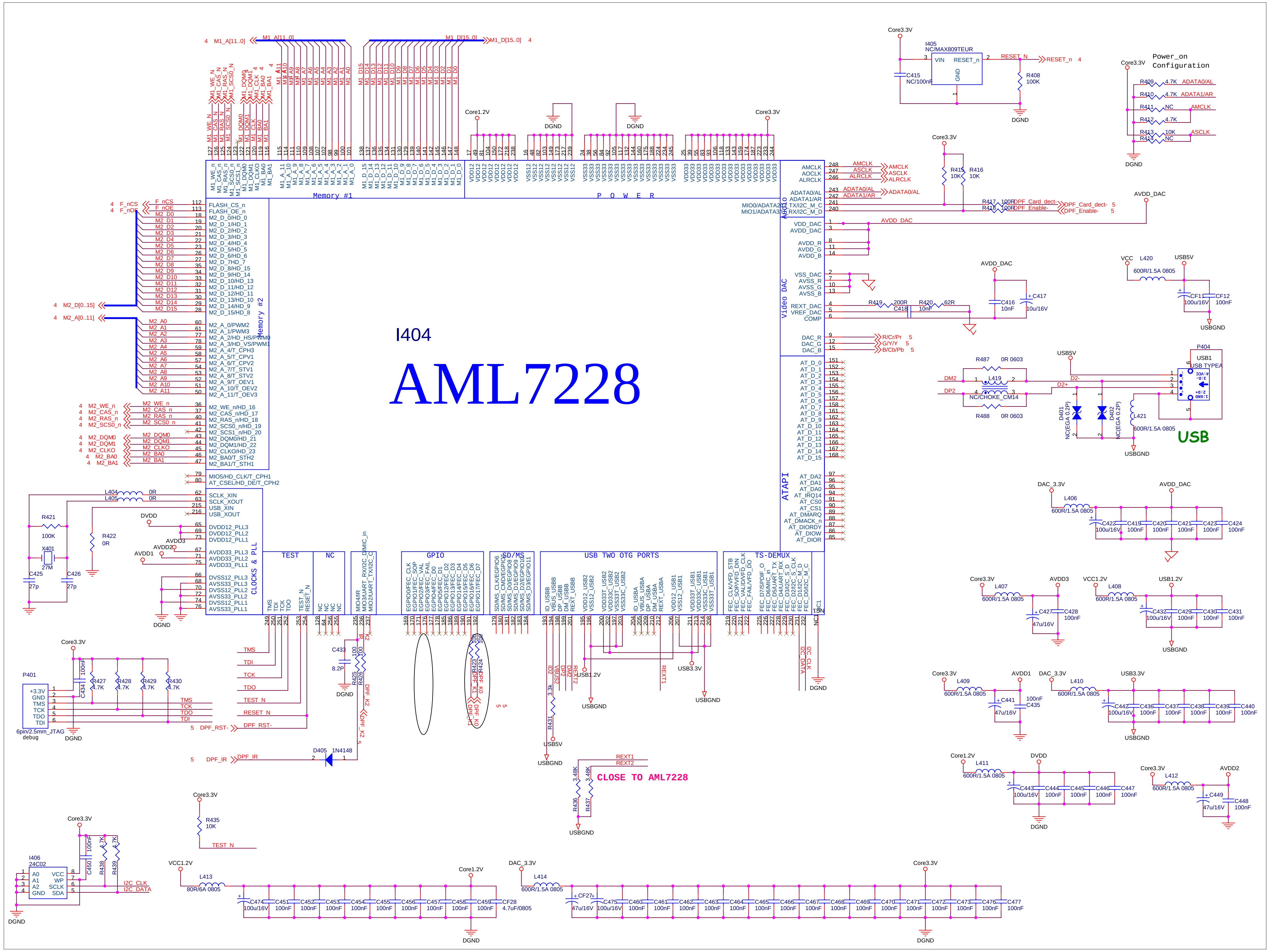
8.14. POWER


19V INV
12V
5V
AC IN 100~240V
T801
D801
4KBP06M
OPTION 4A/600V
LD7576
I801
Q801
APO9N70
I802
TLP621
I803
TL431D
Q803
2SC945P
Q802
2SC945P
Q804
2SC945P
D823
GMR10H200C
D821
GMR10H125C
D822
SB1060
L801
FERRITE CORE 4.5mm
OPTION
F801
T2.5AH/250V
(T2.5AL/250V)
S801
F802
JP
Z805
HZ6B2
Z802
HZ18A-3
Z801
HZ12A-3
Z803
OPTION 2.74K
OF JT240XX.
OPTION 1K.1.21K of
JC240XX

8.15. PHOTO POWER

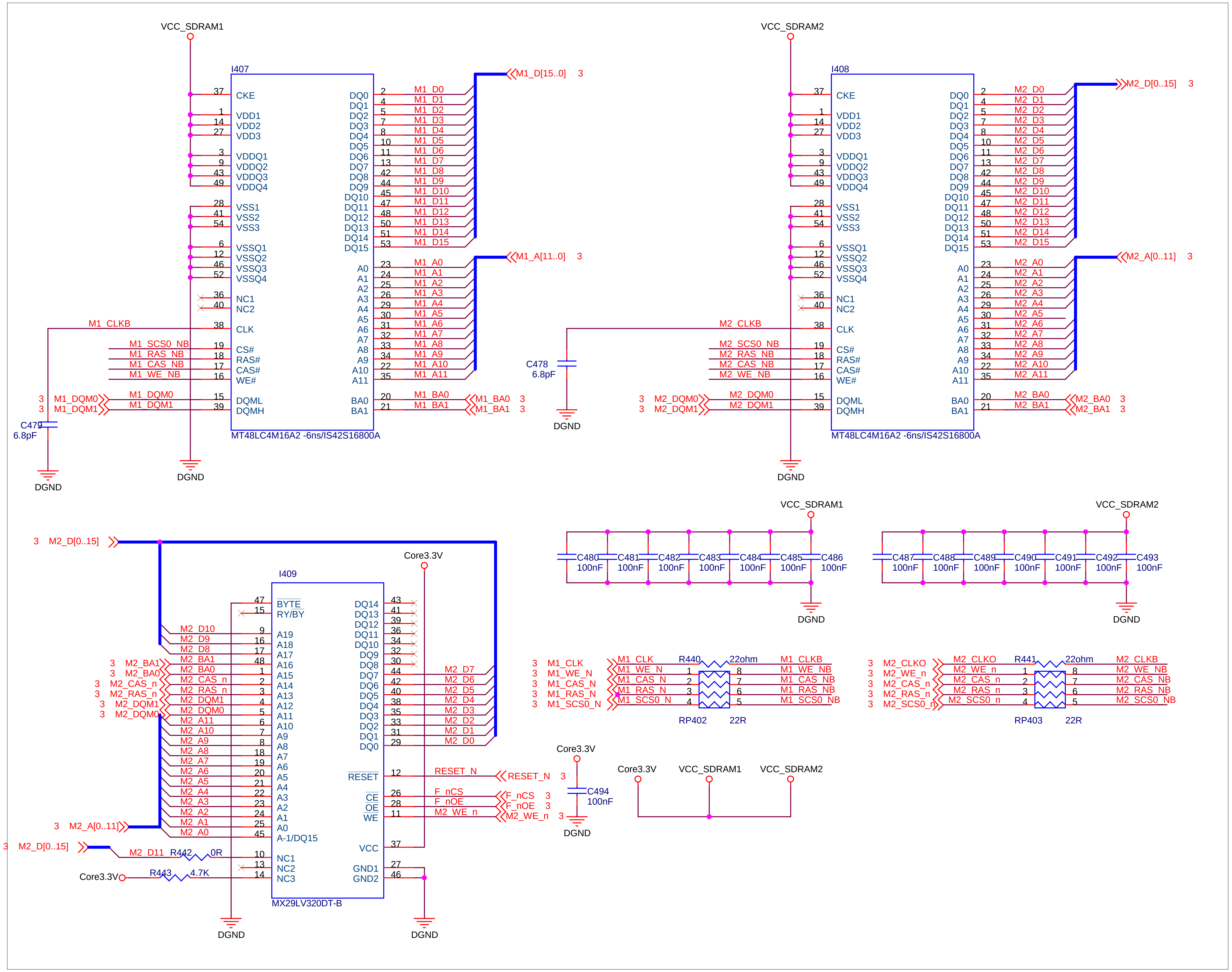


8.16. DECODER

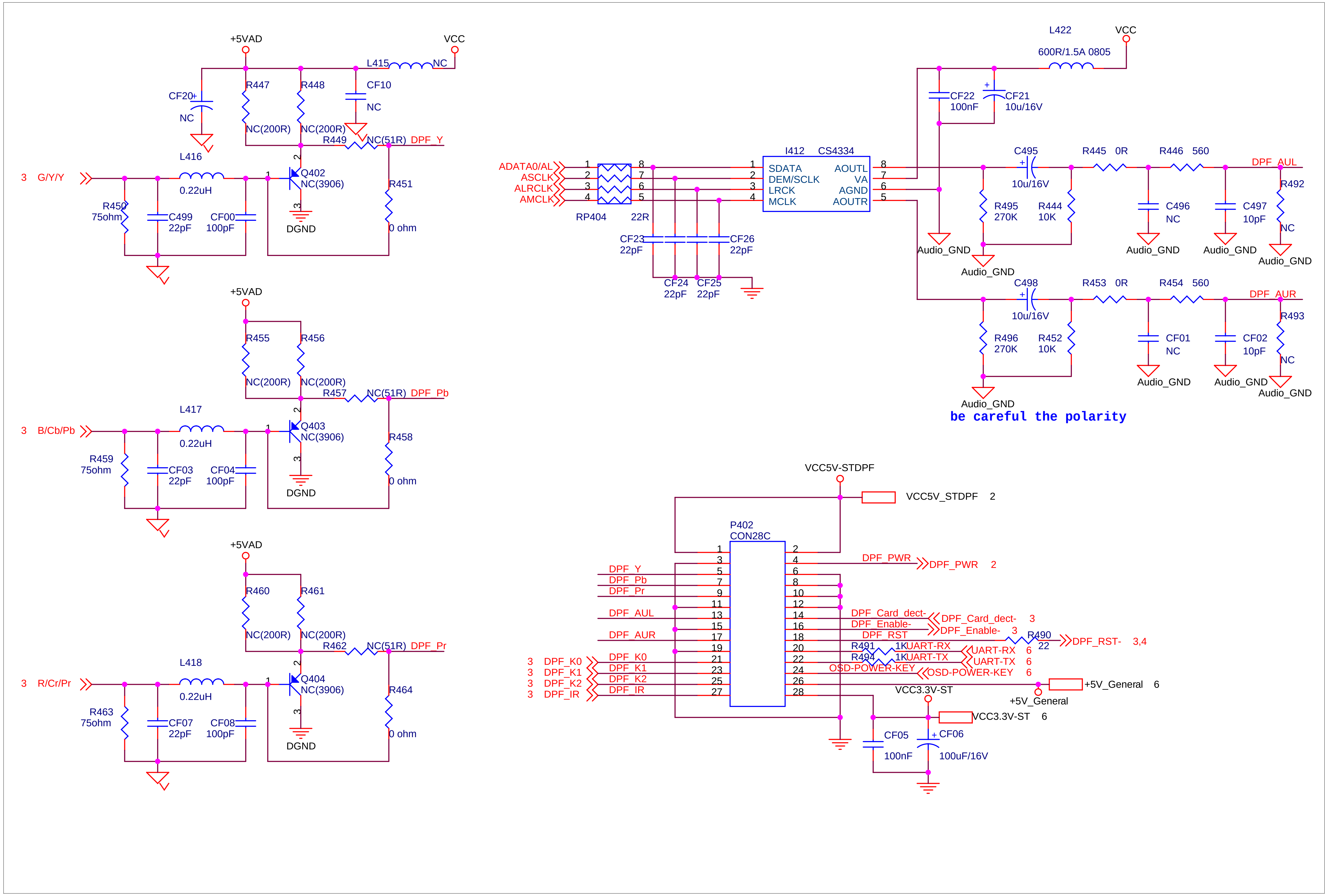


I404
AML7228
Memory #1
Memory #2
P O W E R
Audio
Video DAC
ATAPI
CLOCKS & PLL
TEST
NC
GPIO
SD/MS
USB TWO OTG PORTS
TS-DEMUX
USB
CLOSE TO AML7228
Power_on Configuration
I405 NC/MAX809TEUR
I406 24C02
P401
P404

8.17. MEMORY

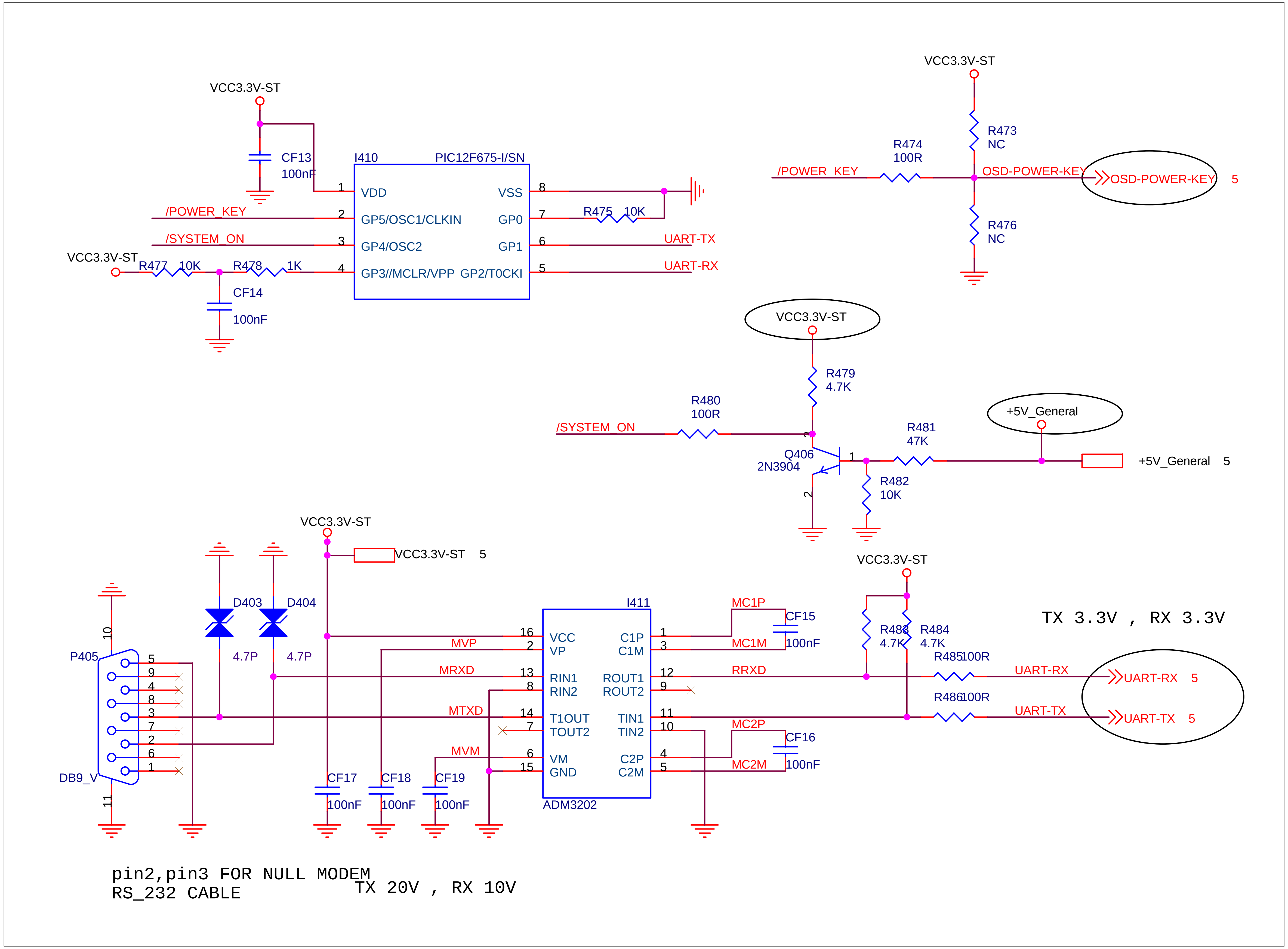


8.18. AV



+5VAD
VCC
L415
NC
CF20
NC
R447
R448
CF10
NC
NC(200R)
NC(200R)
R449
NC(51R)
DPF_Y
L416
0.22uH
3 G/Y/Y
Q402
NC(3906)
R451
R450
75ohm
C499
22pF
CF00
100pF
DGND
0 ohm
R455
R456
R457
DPF_Pb
L417
3 B/Cb/Pb
Q403
R458
R459
CF03
CF04
R460
R461
R462
DPF_Pr
L418
3 R/Cr/Pr
Q404
R464
R463
CF07
CF08
ADATA0/AL
ASCLK
ALRCLK
AMCLK
RP404
22R
CF23
22pF
CF24
CF25
CF26
I412
CS4334
SDATA
DEM/SCLK
LRCK
MCLK
AOUTL
VA
AGND
AOUTR
L422
600R/1.5A 0805
CF22
100nF
CF21
10u/16V
C495
R445 0R
R446 560
DPF_AUL
R492
R495
270K
R444
10K
C496
C497
10pF
Audio_GND
C498
R453 0R
R454 560
DPF_AUR
R493
R496
R452
CF01
CF02
be careful the polarity
VCC5V-STDPF
VCC5V_STDPF 2
P402
CON28C
DPF_PWR
DPF_PWR 2
DPF_Card_dect-
DPF_Card_dect- 3
DPF_Enable-
DPF_Enable- 3
DPF_RST
R490
22
DPF_RST- 3,4
R491 1K
UART-RX
UART-RX 6
R494 1K
UART-TX
UART-TX 6
OSD-POWER-KEY
OSD-POWER-KEY 6
+5V_General 6
+5V_General
VCC3.3V-ST
VCC3.3V-ST 6
CF05
100nF
CF06
100uF/16V
DPF_AUL
DPF_AUR
3 DPF_K0
3 DPF_K1
3 DPF_K2
3 DPF_IR
DPF_K0
DPF_K1
DPF_K2
DPF_IR

8.19. RS232

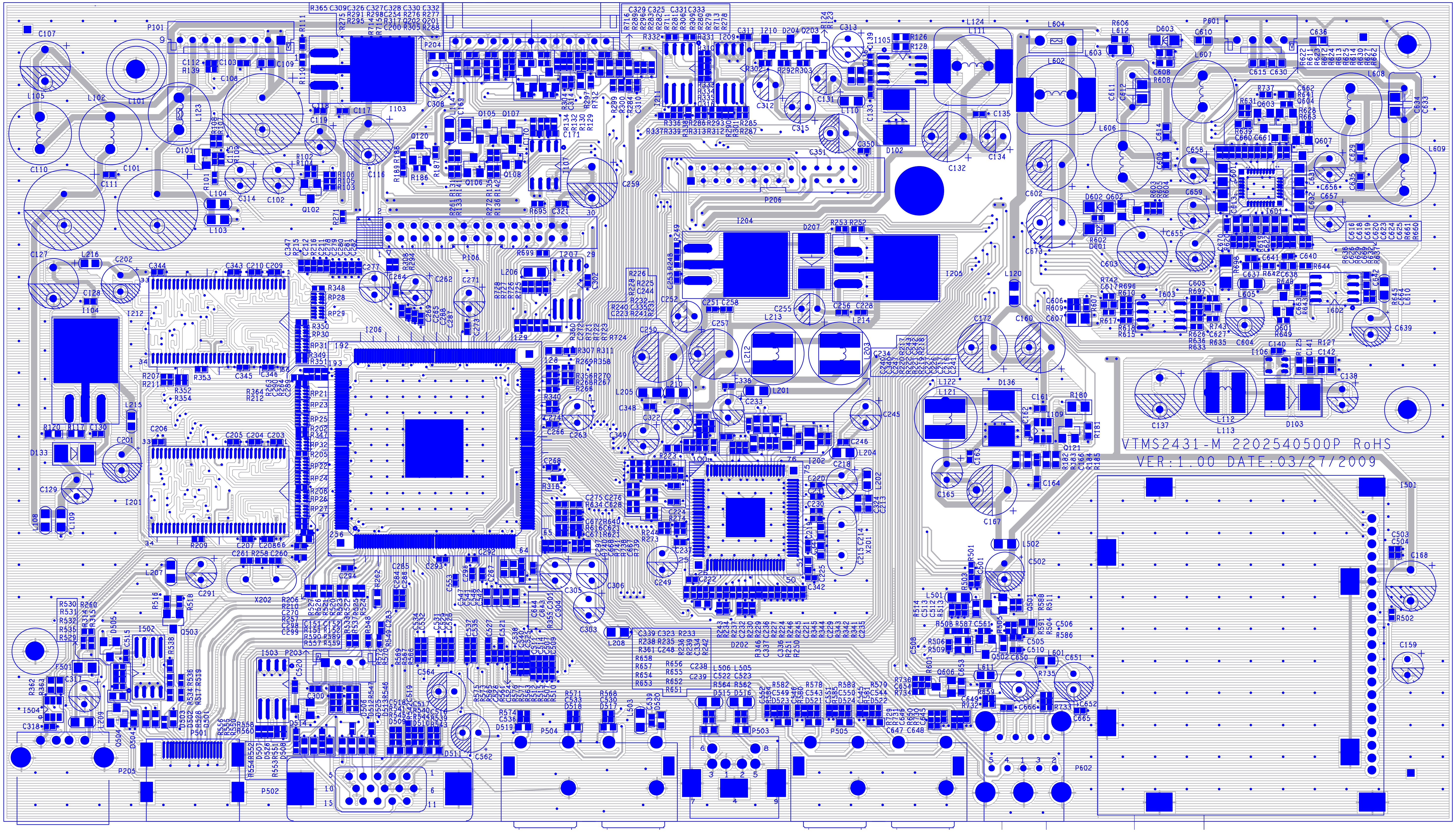


VCC3.3V-ST
CF13
100nF
I410
PIC12F675-I/SN
VDD
VSS
GP5/OSC1/CLKIN
GP0
GP4/OSC2
GP1
GP3//MCLR/VPP
GP2/T0CKI
/POWER_KEY
/SYSTEM_ON
R475 10K
UART-TX
UART-RX
R477 10K
R478 1K
CF14
100nF
R473
NC
R474
100R
OSD-POWER-KEY
R476
NC
R479
4.7K
R480
100R
Q406
2N3904
R481
47K
R482
10K
+5V_General
D403
D404
4.7P
P405
DB9_V
I411
ADM3202
VCC
VP
RIN1
RIN2
T1OUT
TOUT2
VM
GND
C1P
C1M
ROUT1
ROUT2
TIN1
TIN2
C2P
C2M
MVP
MRXD
MTXD
MVM
MC1P
MC1M
RRXD
MC2P
MC2M
CF15
CF16
CF17
CF18
CF19
R483
4.7K
R484
4.7K
R485 100R
R486 100R
TX 3.3V , RX 3.3V
pin2,pin3 FOR NULL MODEM
RS_232 CABLE
TX 20V , RX 10V

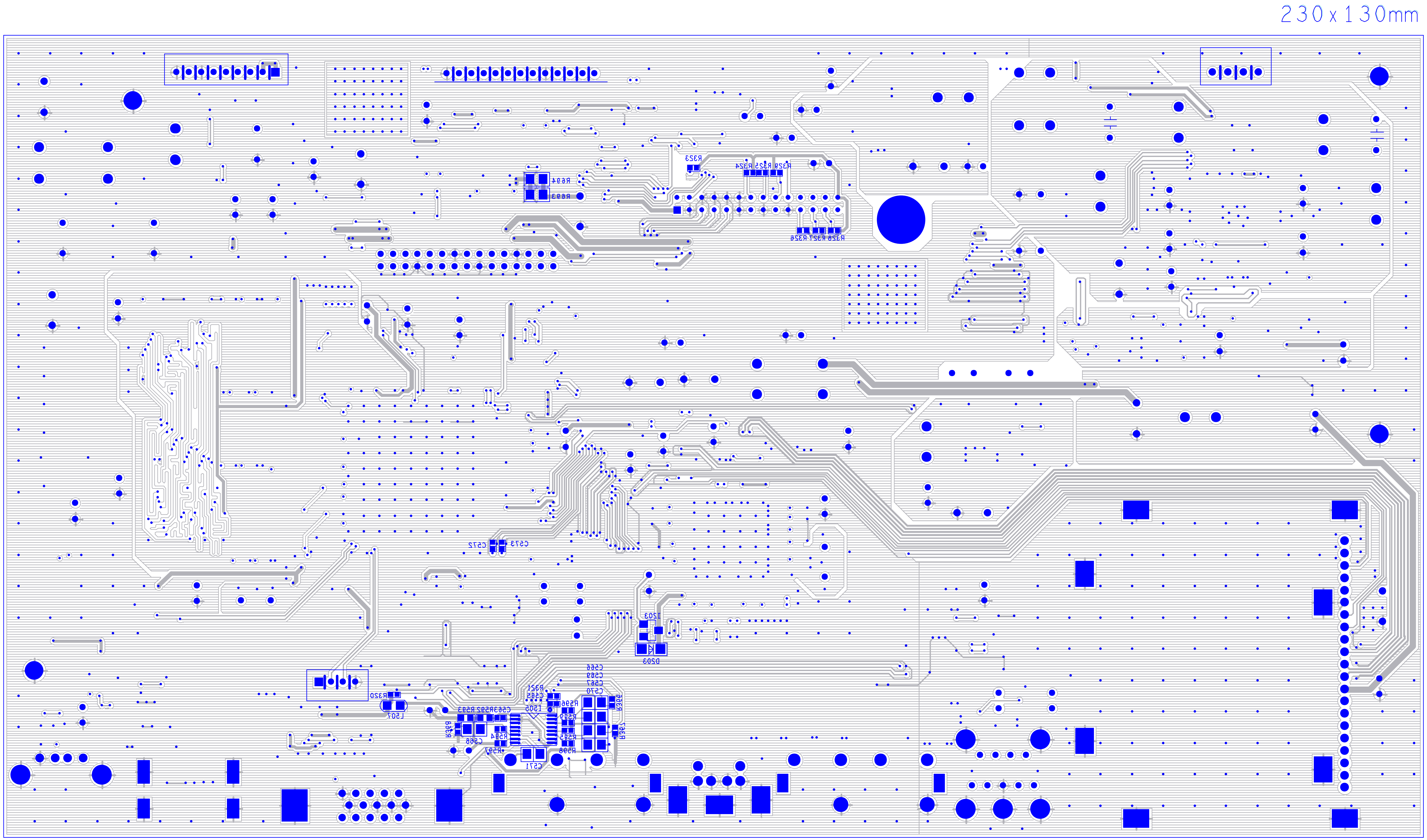
9. PCB Layout Diagrams

9.1. MAIN PCB TOP VIEW

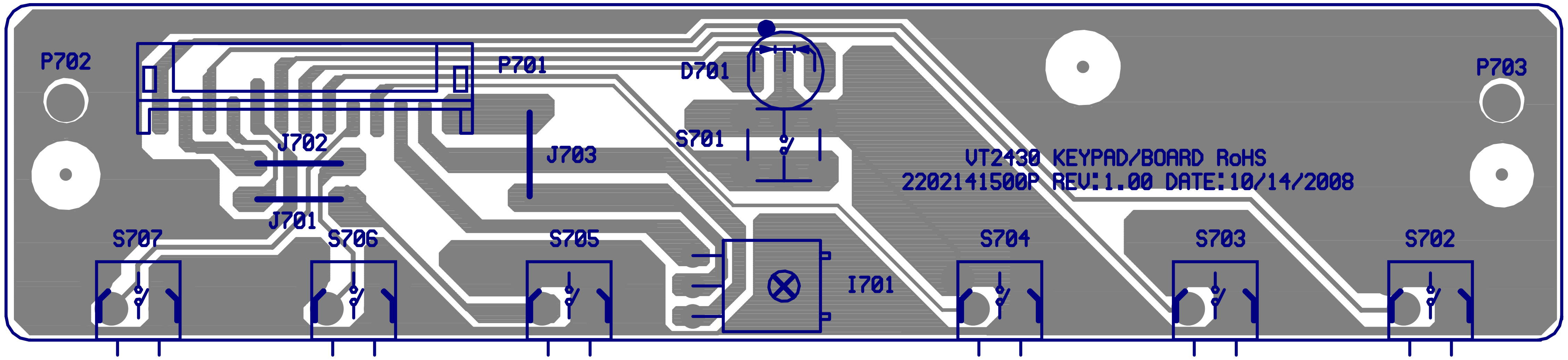
230x130mm



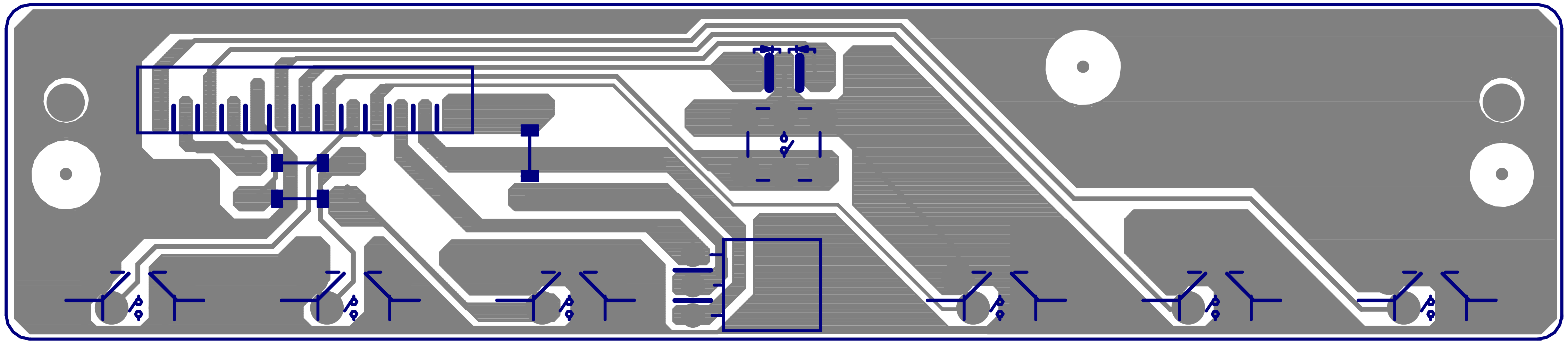
9.2. MAIN PCB BOTTOM VIEW



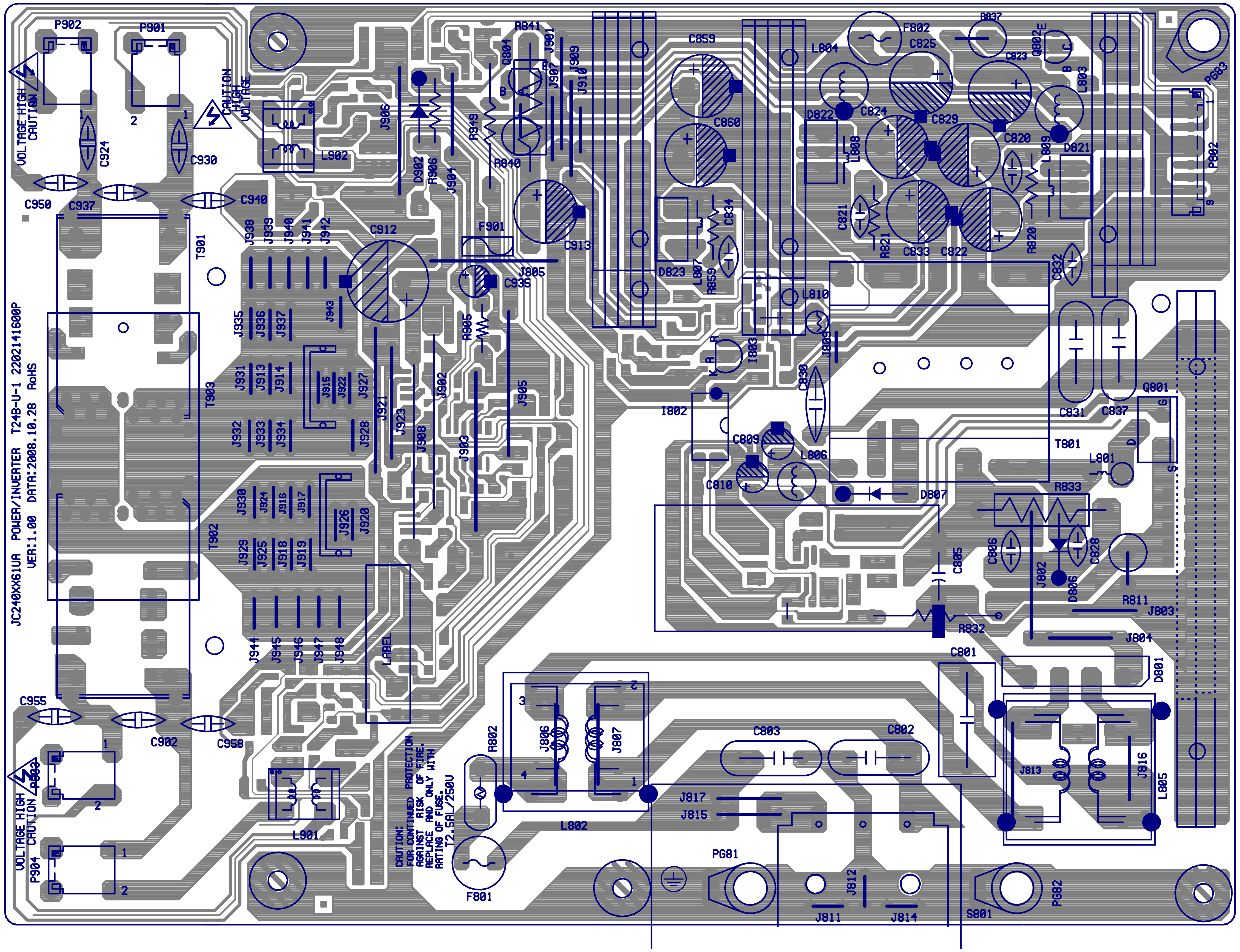
9.3. CON PCB TOP VIEW



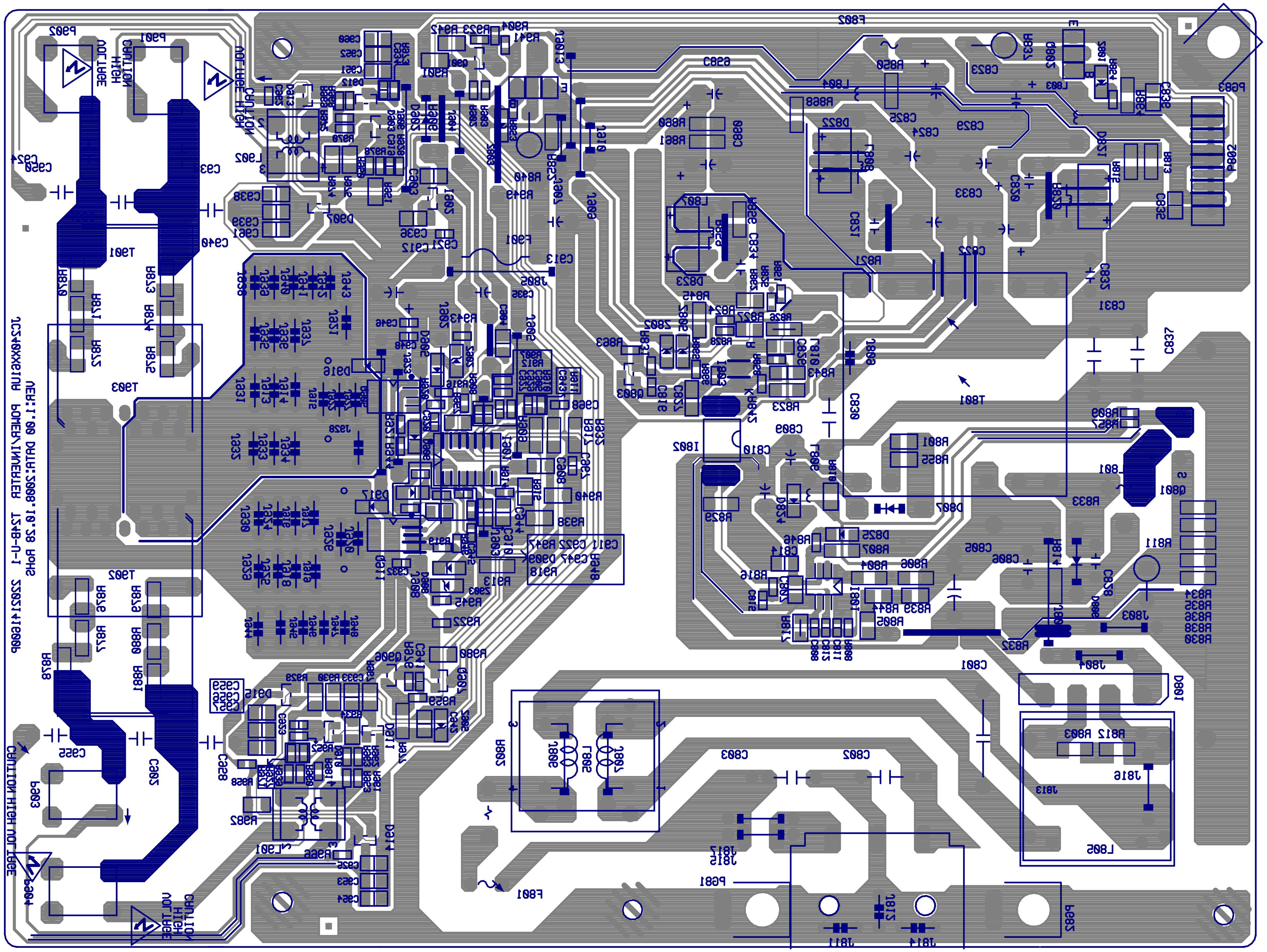
9.4. CON PCB BOTTOM VIEW



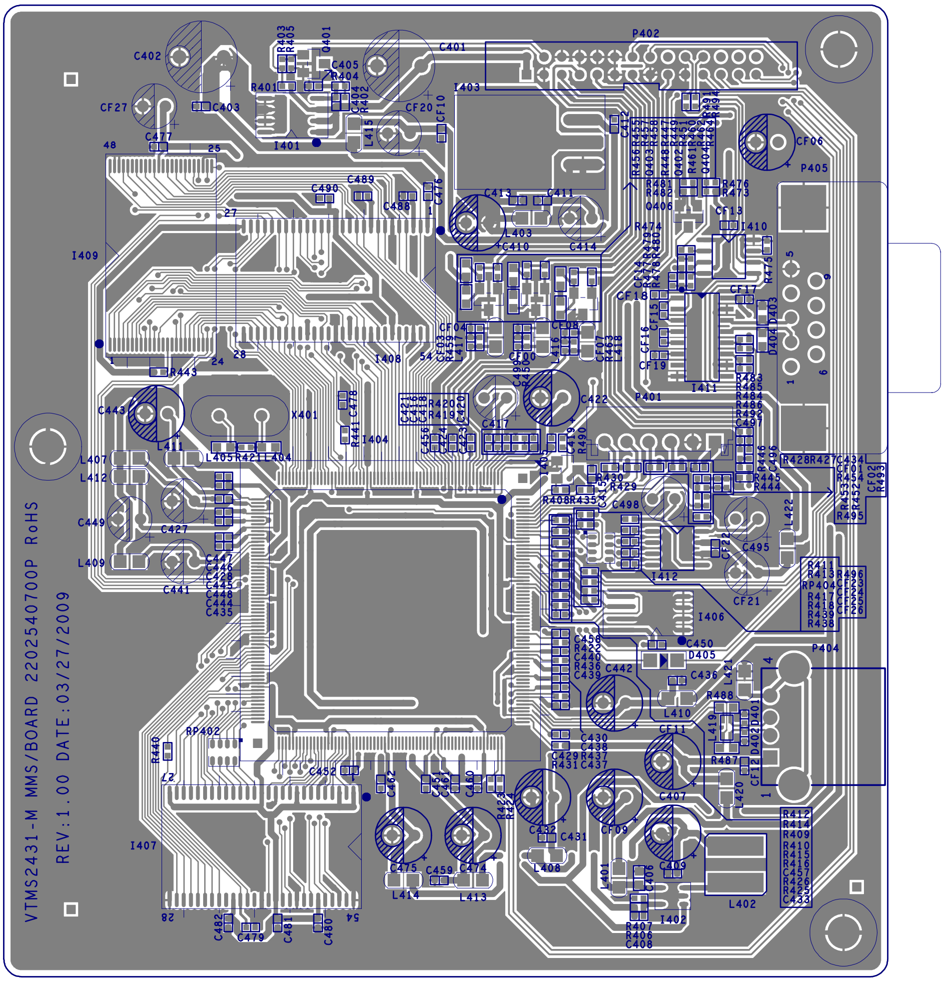
9.5. POWER PCB TOP VIEW



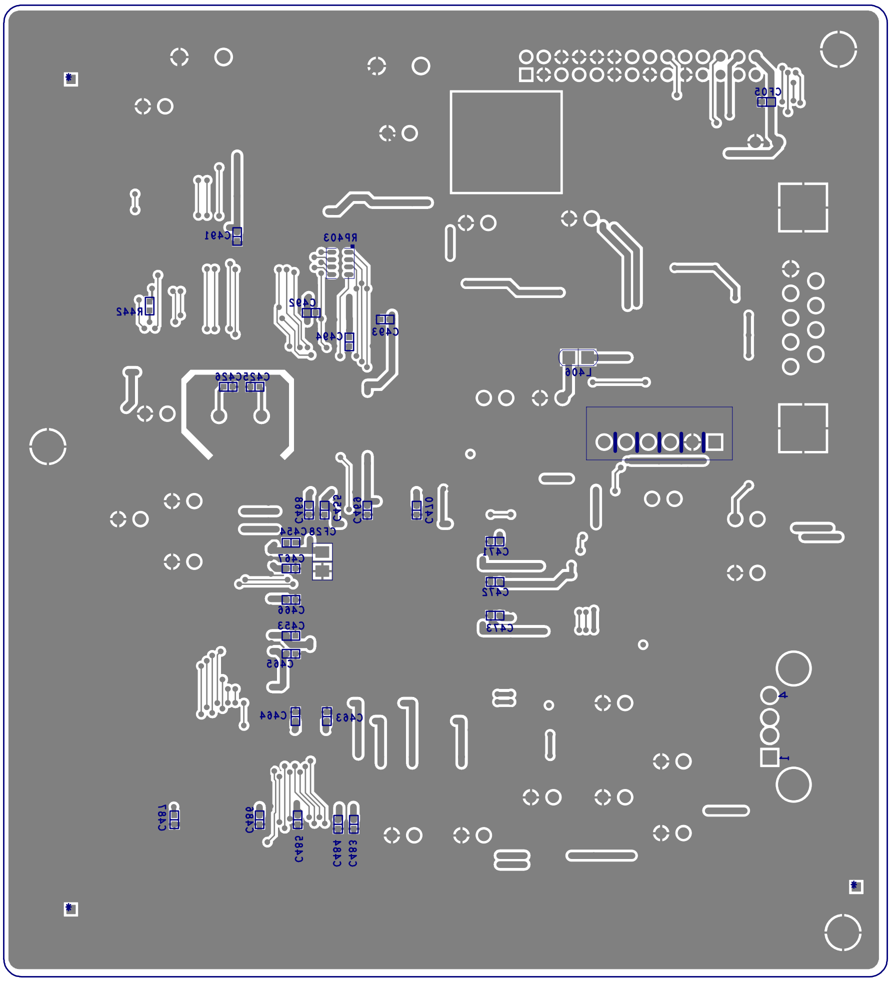
9.6. POWER PCB BOTTOM VIEW



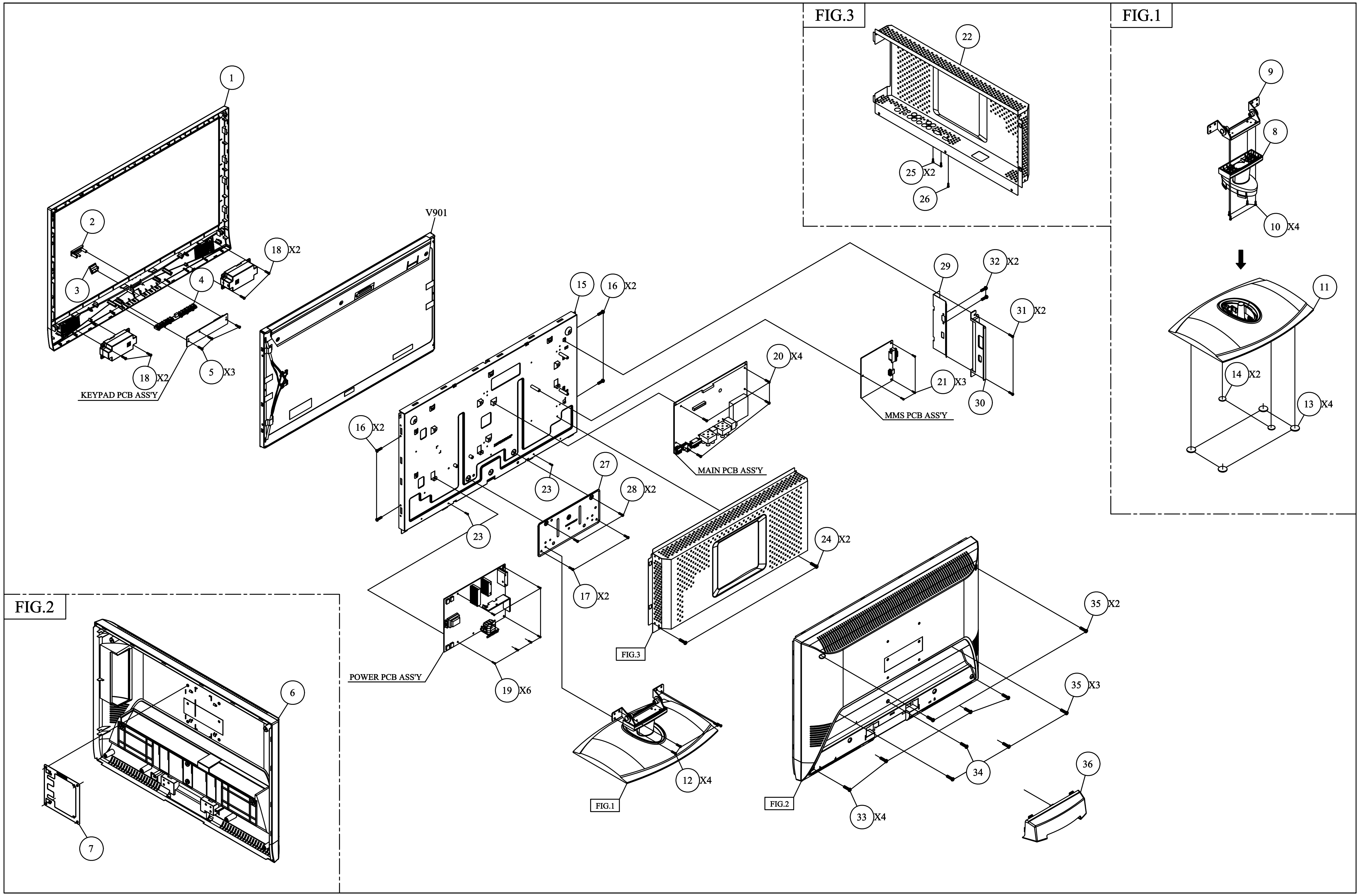
9.7. MMS PCB TOP VIEW

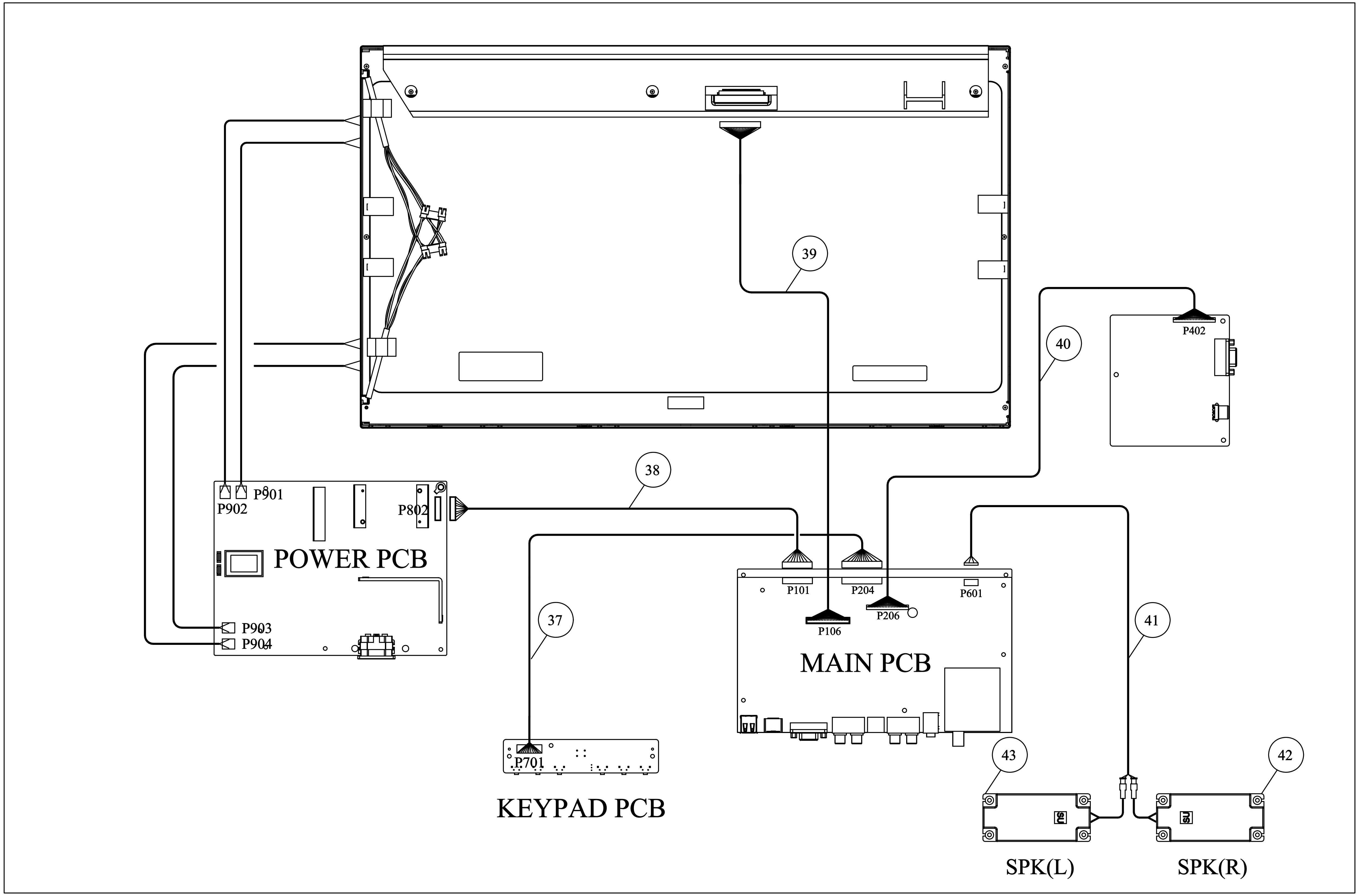


9.8. MMS PCB BOTTOM VIEW



10. Exploded View And Exploded Parts List




39
40
P402
38
P901
P902
P802
POWER PCB
P101
P204
P601
P206
P106
P903
P904
37
41
MAIN PCB
P701
KEYPAD PCB
43
42
SPK(L)
SPK(R)

Exploded Parts List (VTMS2431)

ViewSonic Model Number: VS12335-2M

Rev:1a

Item	ViewSonic P/N	Ref. P/N	Description		Q'ty
1	NA	2024285401P	FRONT BEZEL	VT2430 ABS 94HB G.L BLACK C	1
2	NA	2053760201P	LED INDIC.-PWR	N2430P UT0520T COLOR T57015	1
3	NA	2033154000P	IR COVER	N2430P PC GE-121R-21051	1
4	NA	2044275301P	FUNCTION KEY	N2430P ABS 94HB BLACK C	1
5	M-SCW-0824-0285	2084730082P	SCREW BND T+	M3X8(BND T+)	3
6	NA	2022281703P	CABI BACK	VTMS2431-M ABS 94HB BLACK C(PHOTO FRAME)	1
7	HW-00003031	2071872900P	BRACKET FIX	JT198QP SECC 0.8T WALL MOUNT	1
8	NA	2028560601P	NECK	N2430P ABS 94HB BLACK C	1
9	NA	2106664700P	HINGE	N2430P SECC T=2.0°~20° 50KG-CM	1
10	HW-00008139	2086240102P	SCREW P SW+	M4*10 PSW+ ZN	4
11	NA	2028268101P	STAND	VT2430 ABS 94HB G.L BLACK C	1
12	NA	2082640102P	SCREW	M4X10 P=0.7	4
13	NA	2039820601P	FOOT PAD	φ 20*2.5T SQUARE GRAIN BLK	4
14	NA	2039820200P	FOOT PAD	φ 10*2T SQUARE GRAIN BLK	2
15	NA	2071990655P	METAL FITTG	JC236 PANEL SECC T=0.8 (TW-PHOTO-FRAME)	1
16	HW-00008516	2082630052P	SCREW	M3*5MM	4
17	M-SCW-0824-0285	2084730082P	SCREW BND T+	M3X8(BND T+)	2
18	M-SCW-0824-0123	2084740102P	SCREW BND T+	M4X10(BND T+)	4
19	M-SCW-0824-0811	2080003700P	SCREW SPE	ISZZTER001A M3*6L MSWR17/FZMYI	6
20	M-SCW-0824-0811	2080003700P	SCREW SPE	ISZZTER001A M3*6L MSWR17/FZMYI	4
21	M-SCW-0824-0811	2080003700P	SCREW SPE	ISZZTER001A M3*6L MSWR17/FZMYI	3
22	NA	2071684055P	SHIELD PLATE	JC236 SPTE T=0.3T (PHOTO)	1
23	M-SCW-0824-0811	2080003700P	SCREW SPE	ISZZTER001A M3*6L MSWR17/FZMYI	2
24	M-SCW-0824-0285	2084730082P	SCREW BND T+	M3X8(BND T+)	2
25	M-SCW-0824-6945	2080004000P	SCREW SPE	STAND-OFF HEX #4-40UNC H5*5*7L	2
26	M-SCW-0824-6719	2082630062P	SCREW	M3X6 P=0.5	1
27	C-00009328	2071895900P	BRACKET FIX	N2430P FOR HINGE T=1.0mm	1
28	M-SCW-0824-6719	2082630062P	SCREW	M3X6 P=0.5	2
29	NA	2072055233P	METAL FITTG-I/O	JC240A&B IO-SIDE SECC 0.6T(PHOTO)	1
30	NA	2027274901P	DUST COVER	VT2430 ABS 94HB BLACK C IO-SIDE-COVER (PHOTO)	1
31	M-SCW-0824-6719	2082630062P	SCREW	M3X6 P=0.5	2
32	M-SCW-0824-6945	2080004000P	SCREW SPE	STAND-OFF HEX #4-40UNC H5*5*7L	2
33	NA	2084740104P	SCREW BND T+	M4X10(BND T+) (BLK)	4
34	NA	2082630084P	SCREW	M3X8 P=0.5 BLACK	1
35	NA	2082630064P	SCREW	M3*6 P=0.5 BLACK	5
36	C-00009325	2027273901P	DUST COVER	N2430P ABS 94HB BLACK C	1
37	CB-00008888	2427413021P	WIRE HARNESS	13/13P H/H 1007#26 L=410mm	1
38	CB-00008889	2427409020P	WIRE HARNESS	9/9P H/H 1007#24 L=90mm	1
39	CB-00008890	2427430071P	WIRE HARNESS	30/2*15P H/H 1571#28 L=130mm	1
40	CB-00009005	2427428001P	WIRE HARNESS	2*14/2*14P H/H 1185#28+1107#26 L=130mm	1
41	CB-00008891	2427404070P	WIRE HARNESS	4/2+2P H/A 1007#24 L=490mm	1
42	E-00009285	2391306004P-01	SPEAKER ASS'Y(RA)	6W/8ohm L90*W34*H28mm DONGLI (X09040PM05-53-B)	1
42	E-00009386	2391306004P-02	SPEAKER ASS'Y(RB)	6W/8ohm L90*W34*H28mm YUNGTECH	1
43	E-00009285	2391306004P-01	SPEAKER ASS'Y(RA)	6W/8ohm L90*W34*H28mm DONGLI (X09040PM05-53-B)	1
43	E-00009386	2391306004P-02	SPEAKER ASS'Y(RB)	6W/8ohm L90*W34*H28mm YUNGTECH	1

11. Recommended Spare Parts List

RECOMMENDED SPARE PARTS LIST (VTMS2431)

ViewSonic Model Number: VS12335-2M
Serial No. Prefix: R83
Rev: 1a

Item	Category	Part Name	Description	ECR/ECN	ViewSonic P/N	Ref. P/N	Ref. NO	Compatibility	Location	Universal number#
1	**Accessories: [Adapter, Remote Control;Power Cord]**	AC POWER CORD	USA WALL 1.83M BLACK		A-00005362	2427130046P		Main Source	P951	
2		REMOTE CONTROL	42-Key ViewSonic VTMS2431-1M Remote		A-00008456	2419200224P		Main Source	H901	
3	**PC Board Assembly: [All PCBA]**	PCB ASS'Y BLOCK (MAIN)			B-00009549	6201-7024166201		Main Source	201	
4		PCB ASS'Y BLOCK (CON)			B-00009346	6202-7024166111		Main Source	202	
5		PCB ASS'Y BLOCK (POWER)			B-00009347	6204-7024166111		Main Source	204	
6		PCB ASS'Y BLOCK (DPF)			B-00009548	6209-7024166201		Main Source		
7	**Cabinets: [Front Panel, All Covers, Base Assembly]**	BEZEL ASS'Y	N2430P ABS 94HB BLACK C		C-00009216	2603308974		Main Source		
8		CABI BACK ASSY	N2430P ABS 94HB BLACK C		C-00009456	2603408223		Main Source		
9		STAND ASSY	VT2430 ABS 94HB G.L BLACK C		C-00009218	2603207447		Main Source		
10	**Cables: [All Cables]**	WIRE HARNESS	13/13P H/H 1007#26 L=410mm		CB-00008888	2427413021P		Main Source	P703	
11		WIRE HARNESS	9/9P H/H 1007#24 L=90mm		CB-00008889	2427409020P		Main Source	P812	
12		WIRE HARNESS	30/2*15P H/H 1571#28 L=130mm		CB-00008890	2427430071P		Main Source	P981	
13		WIRE HARNESS	2*14/2*14P H/H 1185#28+1107#26 L=130mm		CB-00009005	2427428001P		Main Source	P982	
14		WIRE HARNESS	4/2+2P H/A 1007#24 L=490mm		CB-00008891	2427404070P		Main Source	P988	
15	**Documentation: [Quick Start Guide, CD Rom; Label]**	OWNER GUIDE	VTMS2431-1M VS12335-2M USA		DC-00009539	2001132046P		Main Source	6P80	
16		GUARANTY CARD	VIEWSONIC VTMS2431-1M QSG-ENGLISH		DC-00009540	2002310806P		Main Source	6P81	
17		ATTACH SHEET	VIEWSONIC RETURN PREVENTION FLYER-LCD TV		DC-00009054	2001950220P		Main Source	6P83	
18		GUARANTY CARD	VIEWSONIC VTMS2431-1M QSG-FRENCH		DC-00009541	2002310807P		Main Source	6P84	
19	**Electronic Components: [CRT-EEPROM, Fly Back Transformer, Microprocessor] [LCD TV-Panel]**	LCD PANEL	M236H1-L01 (A) CMO (2/5/5 , ND 8%)		E-00009190	2212018900P		Main Source	V901	
20	**Packing Material: [Box, Foam, Bags]**	CARTON BOX	VIEWSONIC VTMS2431-1M VS12335-2M		P-00009475	2011124004P		Main Source	6P01	
21		POLYFOAM	N2430P (R) EPS		P-00009323	2012114500P		Main Source	6P20	
22		POLYFOAM	N2430P(L) EPS		P-00009324	2012114600P		Main Source	6P21	

Remark 1: Above listed items are examples, supplier can expand the rows to add more necessary item
Remark 2: All revised RSPLs with newly added items or any change made should be highlighted and correlated with the ECN/ECR approved by ViewSonic Corporation. This is to eliminate repeated cross checks of each between this version and prior versions.

BOM LIST (VTMS2431)

ViewSonic Model Number: VS12335-2M
Serial No. Prefix: R83

Item	ViewSonic P/N	Ref. P/N	Description		Location	Universal number#	Q'ty	
1	NA	27037C4800	PCB DPF	VTM2431-M			1	PC
2	NA	27057C4800	AUTOINSERT-DPF	VTMS2431-M			1	PC
3	NA	27193C4800	MANUAL INSERT-DPF	VTMS2431-1M			1	PC
4	NA	27077C4800	SMT-DPF	VTMS2431-M			1	PC
5	NA	27281C4800	V-TYPE-DPF	VTMS2431-M			1	PC
6	NA	27199C4800	SMT-SOLDER-SIDE-DPF	VTMS431-M			1	PC
7	B-00009549	6201-7024166201	PCB ASS'Y BLOCK (MAIN)				1	PC
8	B-00009346	6202-7024166111	PCB ASS'Y BLOCK (CON)				1	PC
9	B-00009347	6204-7024166111	PCB ASS'Y BLOCK (POWER)				1	PC
10	B-00009548	6209-7024166201	PCB ASS'Y BLOCK (DPF)				1	PC
11	NA	2434420400P	AL SHIELDING TAPE	W40*L40 AL			1	PC
12	NA	2433305020P-01	SHIELDING FOAM	W10*H6.5*L20mm JOINSET			1	PC
13	NA	2433310021P-01	SHIELDING FOAM	W10*H5*L25mm JOINSET			1	PC
14	CB-00008888	2427413021P	WIRE HARNESS	13/13P H/H 1007#26 L=410mm			1	PC
15	CB-00008889	2427409020P	WIRE HARNESS	9/9P H/H 1007#24 L=90mm			1	PC
16	CB-00008890	2427430071P	WIRE HARNESS	30/2*15P H/H 1571#28 L=130mm			1	PC
17	CB-00009005	2427428001P	WIRE HARNESS	2*14/2*14P H/H 1185#28+1107#26 L=130mm			1	PC
18	CB-00008891	2427404070P	WIRE HARNESS	4/2+2P H/A 1007#24 L=490mm			1	PC
19	E-00009190	2212018900P	LCD PANEL	M236H1-L01 (A) CMO (2/5/5 , ND 8%)			1	PC
20	NA	2391306004P-01	SPEAKER ASS'Y	6W/8ohm L90*W34*H28mm DONGLI (X09040PM05-53-B)			1	PC
21	NA	2391306004P-02	SPEAKER ASS'Y	6W/8ohm L90*W34*H28mm YUNGTECH			1	PC
22	NA	2391306004P-01	SPEAKER ASS'Y	6W/8ohm L90*W34*H28mm DONGLI (X09040PM05-53-B)			1	PC
23	NA	2391306004P-02	SPEAKER ASS'Y	6W/8ohm L90*W34*H28mm YUNGTECH			1	PC
24	NA	2084730082P	SCREW BND T+	M3X8(BND T+)			3	PC
25	NA	2061254003P	SPONGE	SPONGE BLACK 20*50mm T=7mm			2	PC
26	NA	2071800300P	BRACKET FIX	62*8*3.4 T=0.5MM WITH PVC TUBE			1	PC
27	NA	2504100800P	PLASTIC TAPE	PL-CELLONO.60			1600	MM
28	NA	2504500200P	FASTENING TAPE	MASKING TAPE,18M/M (WIDTH)			567	MM
29	NA	2504200700P	ADHESI TAPE	3M 1350(b) 25*80			420	MM
30	NA	2504100900P	PLASTIC TAPE	PL-CELLONO.75			245	MM
31	C-00009216	2603308974	BEZEL ASS'Y	N2430P ABS 94HB BLACK C			1	PC
32	NA	2071990655P	METAL FITTG	JC236 PANEL SECC T=0.8 (TW-PHOTO-FRAME)			1	PC
33	NA	2082630052P	SCREW	M3*5MM			4	PC
34	NA	2084730082P	SCREW BND T+	M3X8(BND T+)			2	PC
35	NA	2084740102P	SCREW BND T+	M4X10(BND T+)			4	PC
36	NA	2080003700P	SCREW SPE	ISZZTER001A M3*6L MSWR17/FZMYI			6	PC
37	NA	2080003700P	SCREW SPE	ISZZTER001A M3*6L MSWR17/FZMYI			4	PC
38	NA	2080003700P	SCREW SPE	ISZZTER001A M3*6L MSWR17/FZMYI			3	PC
39	NA	2071684055P	SHIELD PLATE	JC236 SPTE T=0.3T (PHOTO)			1	PC
40	NA	2080003700P	SCREW SPE	ISZZTER001A M3*6L MSWR17/FZMYI			2	PC
41	NA	2084730082P	SCREW BND T+	M3X8(BND T+)			2	PC
42	NA	2080004000P	SCREW SPE	STAND-OFF HEX #4-40UNC H5*5*7L			2	PC
43	NA	2082630062P	SCREW	M3X6 P=0.5			1	PC
44	NA	2071895900P	BRACKET FIX	N2430P FOR HING T=1.2MM			1	PC
45	NA	2082630062P	SCREW	M3X6 P=0.5			2	PC
46	NA	2072055233P	METAL FITTG-I/O	JC240A&B IO-SIDE SECC 0.6T(PHOTO)			1	PC
47	NA	2027274901P	DUST COVER	VT2430 ABS 94HB BLACK C IO-SIDE-COVER (PHOTO)			1	PC
48	NA	2082630062P	SCREW	M3X6 P=0.5			2	PC
49	NA	2072467100P	INSULATOR	L110*W55*T0.5 mm			1	PC
50	NA	2080004000P	SCREW SPE	STAND-OFF HEX #4-40UNC H5*5*7L			2	PC
51	NA	2061551000P	THERMAL PAD	22*12*10MM			1	PC
52	NA	2005100401P	BATTERY,DRY	R6PGS 1.5V (AA) English TOSHIBA			1	PC
53	NA	2005100401P	BATTERY,DRY	R6PGS 1.5V (AA) English TOSHIBA			1	PC
54	A-00008456	2419200224P	REMOTE CONTROL	42-Key ViewSonic VTMS2431-1M Remote			1	PC
55	A-00005362	2427130046P	AC POWER CORD	USA WALL 1.83M BLACK			1	PC
56	C-00009218	2603207447	STAND ASSY	VT2430 ABS 94HB G.L BLACK C			1	PC
57	C-00009456	2603408223	CABI BACK ASSY	VTMS2431-M ABS 94HB G.L BLACK C (PHOTO)			1	PC
58	NA	2603807190	NECK ASSY	N2430P ABS 94HB BLACK C			1	PC
59	NA	2086240102P	SCREW P SW+	M4*10 PSW+ ZN			4	PC
60	NA	2084740104P	SCREW BND T+	M4X10(BND T+) (BLK)			4	PC
61	NA	2082630084P	SCREW	M3X8 P=0.5 BLACK			1	PC
62	NA	2082630064P	SCREW	M3*6 P=0.5 BLACK			5	PC
63	NA	2027273901P	DUST COVER	N2430P ABS 94HB BLACK C			1	PC
64	P-00009475	2011124004P	CARTON BOX	VIEWSONIC VTMS2431-1M VS12335-2M			1	PCS
65	NA	2055632340P	LABEL	VTMS2431-1M VS12335-2M (M) CMO USA			1	PCS
66	NA	2055636111P	LABEL	VTMS2431-1M VS12335-2M SMALL			1	PCS
67	NA	2055613379P	LABEL	VIEWSONIC CONTAINER LABEL			0.02	PCS
68	NA	2055617101P	LABEL	10*20 HI-POT TESTED OK			1	PC
69	NA	2055613392P	LABEL	VSC HIGH VOLTAGE WARNING LABEL			1	PC
70	P-00009323	2012114500P	POLYFOAM	N2430P (R) EPS			1	PC
71	P-00009324	2012114600P	POLYFOAM	N2430P(L) EPS			1	PC
72	NA	2055135531P	LABEL	VTMS2431-1M VS12335-2M CMO USA			1	PCS
73	NA	2013054075P	POLYETHY BAG	900Lx750W T=0.03MM 24" LDPE 9-LANGUAGES			1	PCS
74	DC-00009539	2001132046P	OWNER GUIDE	VTMS2431-1M VS12335-2M USA			1	PCS
75	DC-00009540	2002310806P	GUARANTY CARD	VIEWSONIC VTMS2431-1M QSG-ENGLISH			1	PCS
76	DC-00009054	2001950220P	ATTACH SHEET	VIEWSONIC RETURN PREVENTION FLYER-LCD TV			1	PCS
77	DC-00009541	2002310807P	GUARANTY CARD	VIEWSONIC VTMS2431-1M QSG-FRENCH			1	PCS
78	NA	2013222536P	POLYETHY BAG	250mmX350mmX0.3t ADD>PE-LD<			1	PC
79	NA	2011100130P	CARTON BOX	1125*1125*8 (MM)			0.02	PCS

* Reader's Response*

Dear Readers:
Thank you in advance for your feedback on our Service Manual, which allows continuous improvement of our products. We would appreciate your completion of the Assessment Matrix below, for return to ViewSonic Corporation.

Assessment

A. What do you think about the content of **this** Service Manual?

Unit	*Excellent*	*Good*	*Fair*	*Bad*
1. Precautions and Safety Notices				
2. Specification				
3. Front Panel Function Control Description				
4. Circuit Description				
5. Adjusting Procedure				
6. Trouble Shooting Flow Chart				
7. Block Diagram				
8. Schematic Diagrams				
9. PCB Layout Diagrams				
10. Exploded View And Exploded Parts List				
11. Recommended Spare Parts List				

B. Are you satisfied with **this** Service Manual?

Item	*Excellent*	*Good*	*Fair*	*Bad*
1. Service Manual Content				
2. Service Manual Layout				
3. The form and listing				

C. Do you have any other opinions or suggestions regarding **this** service manual?

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